ICD08274 APRIL 1983 VOL.1 NO.6

$2.50

ELECTRONIC FUN with COMPUTERS & GAMES

INVASION OF THE ANDROBOTS!

It's NOT a game

TEST REPORT: Intellivision II

April Fool Contest!

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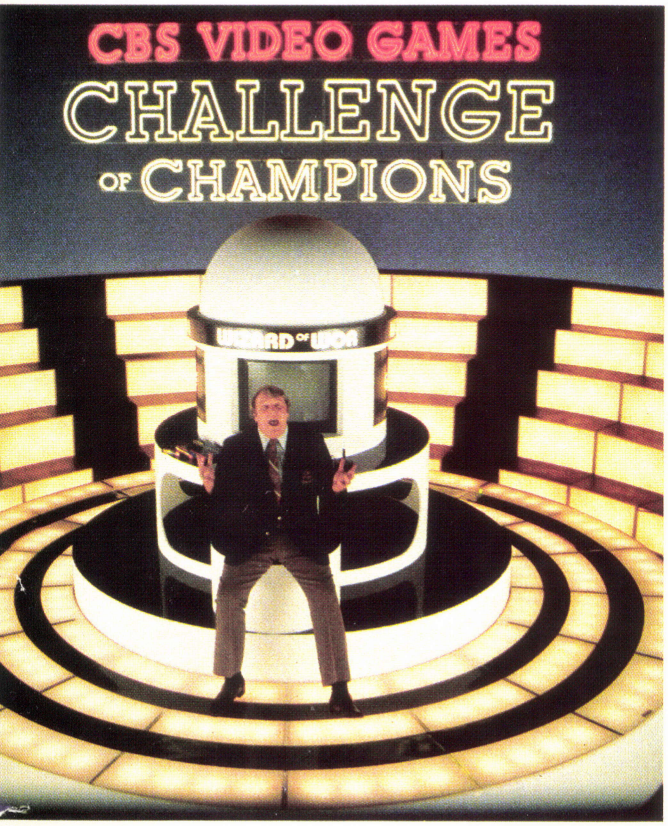
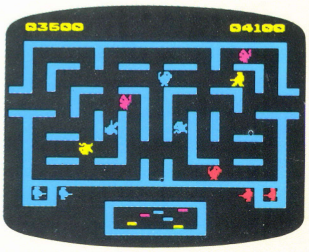
Winning at 'Wizard of Wor' and 'Gorf'. By John Madden.



In our first Challenge of Champions, Ray Johnson of Los Angeles defeated Tony Sarkis of New York and David Hayes, a student at Cal Tech, defeated Brian Anderson, a student at MIT.

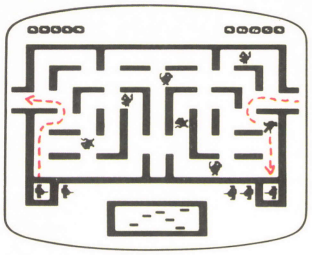
As the sportscaster for CBS Video Games, I get a chance to watch some of the best players in the country in the "Challenge of Champions."

Here are some of their winning strategies.



Wizard of Wor™: You start with three worriors. The object of this game is to defeat the Wizard, his henchmen and your opponent. This is a game you can play alone, or two can play simultaneously. When two play, you have to worry about getting zapped by your opponent as well as the Wizard, and his gang.

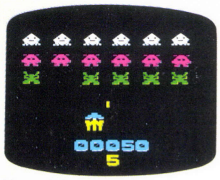
Here's an interesting move you might want to try. Get out into the maze fast, zip out of the escape door, come back in through the opposite side. If you're quick enough, you'll be in perfect position to blitz your opponent's three worriors before they can score any points. The ultimate shutout.



Another variation is to work together. Make a pact not to hit each other (accidents do happen, of course) and go for the record score: 99,500 by Frank Merollo (10/82) and Buz Pryzby (8/82).*

'These are two tough games, but I know you're up to the challenge.'

Gorf™ is four boards in one game. Your father will enjoy this game because with a little luck, he'll be able to go through the four boards a couple of times, but after the third level it starts to get faster...and faster.



Coaching tips: patience

Stick & move

Get position

Hit it high

That's when you separate the players from the parents. You start out aggressively and after 10,000 points the bombs and torpedoes start to come hot and heavy, so be prepared to change to a defensive game plan.

The record high score is still 32,700 by Horace Eckerstrom (9/82),* which gives you some idea of how hard this game is.

Both Wizard of Wor and Gorf are made for the Atari® 2600 System.™ (Look for Intellivision® versions soon.) They're really tough, and the more you play them, the more you'll like them.

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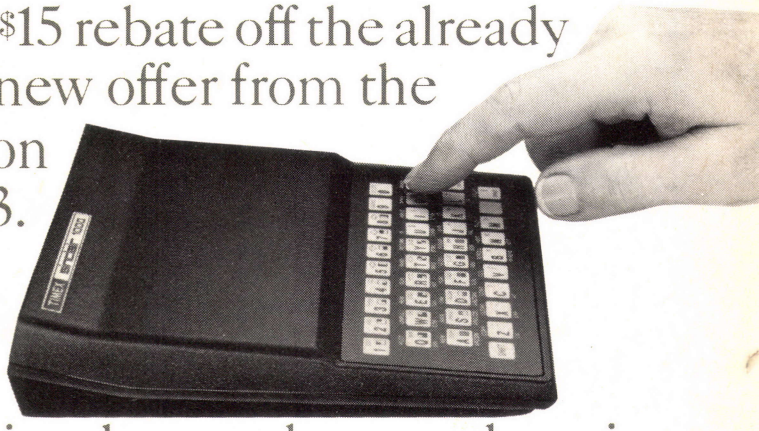
*High scores as of this printing.

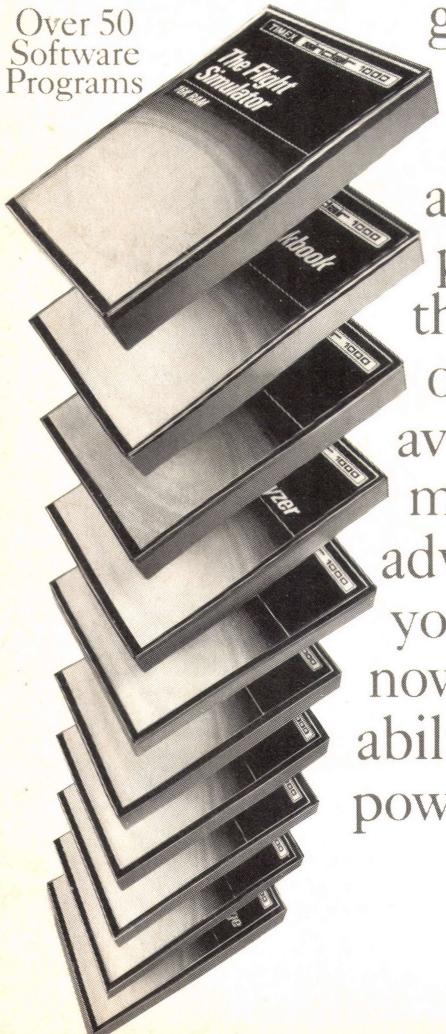
CBS Video Games
Are you up to the challenge?

We've programmed something new into the Timex Sinclair 1000.™

A $15 rebate.

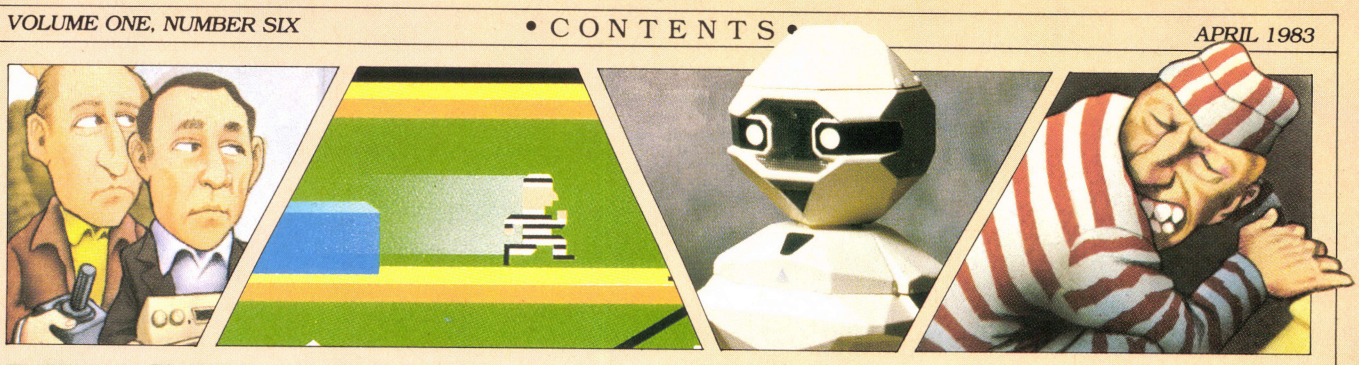
Now Timex has made the world's most affordable personal computer even more affordable. ☐ The Timex Sinclair 1000™ was the first computer to be sold for under $100. And if you act now, you can receive a $15 rebate off the already incredibly low price. ☐ This new offer from the Timex Computer Corporation is good through April 30, 1983. ☐ It's your chance to own a powerful personal computer that includes everything you need to begin. Including a simple step-by-step learning guide that can have you understanding and running programs within hours. ☐ You'll also save enough to start building a library of Timex Sinclair 1000 computer programs on subjects relevant to the way you live. An extensive selection of pre-programmed cassettes is currently available on education, business, home management and entertainment. ☐ Take advantage of this incredible offer now. See your nearest Timex Computer dealer now for details. But hurry, computer availability is limited. ☐ Now more than ever, the power of the computer is within your reach.





TIMEX sinclair 1000

© Timex Computer Corporation, 1983



ELECTRONIC FUN with COMPUTERS & GAMES

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PARLEZ-VOUS BASIC PART II *By Randi Hacker* In which we take a few more steps towards fluency and learn (among other things) where to GOSUB **50**

LOOKALIKE GAMES *By Raymond Dimetrosky* There are more than 400 VCS games in the Naked City and many of them look alike. But do they play alike? *EF* answers that question and tells you which are the best of the bunch **70**

VIC PIX *By Martin Bass* As if business application programs and home finance weren't exciting enough, you can also turn your VIC into an artistic medium **80**

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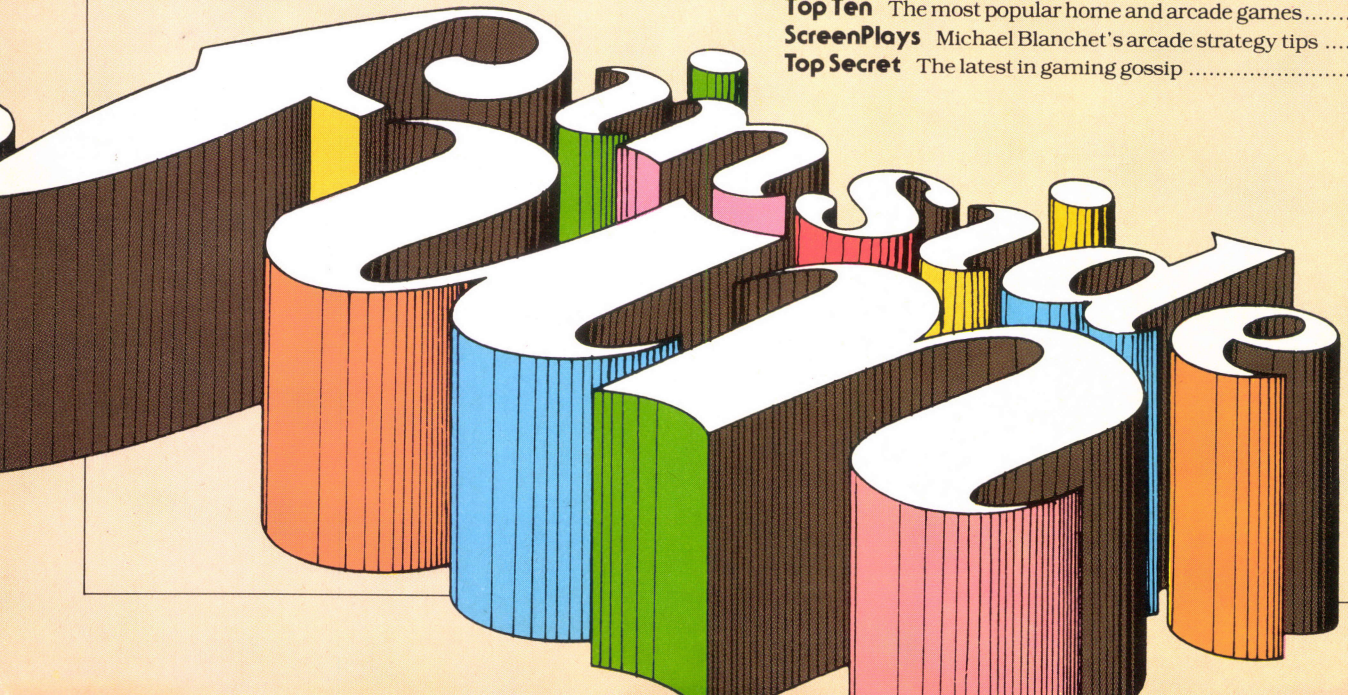
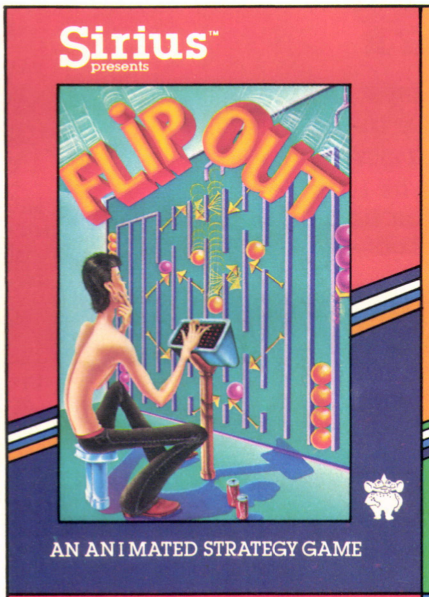
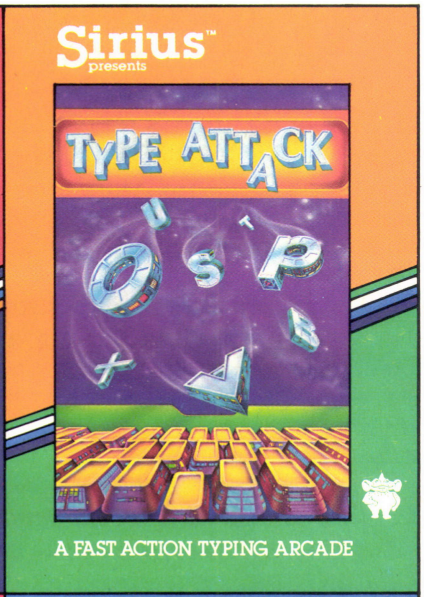


Have A Great Playday!

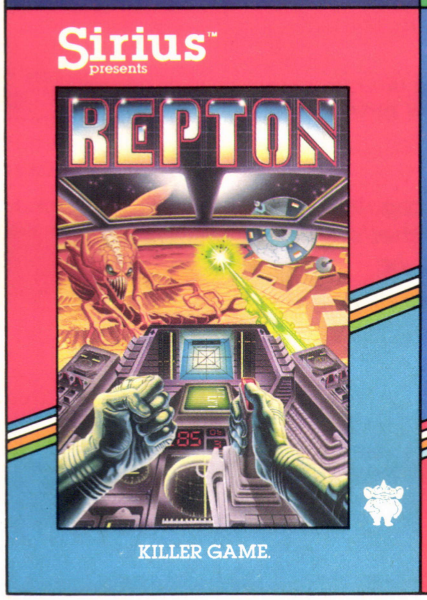
Take your marble to the top. Pick your spot and let it drop. Hope for a flip instead of a flop. Once you get it, the fun never stops! It's FLIP OUT — a crazy new strategy game for one or two players. Each marble you drop causes a chain reaction, so take your time and plan carefully. Plan right and you'll flip, if you didn't you Flip Out!

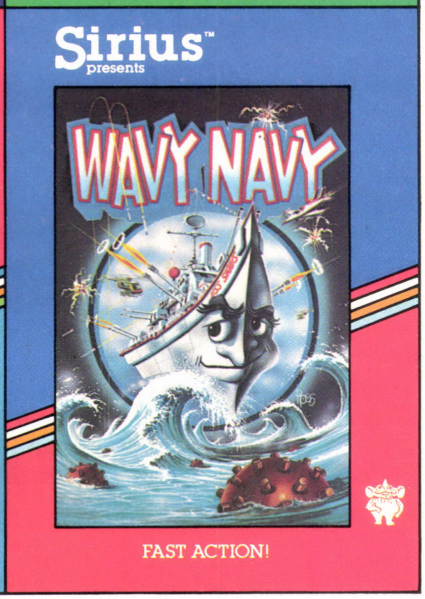




Turn your keyboard into a typing arcade! You can blast attacking letters and words right out of the sky. Type Attack was designed by a professional educator and the fast action game experts at Sirius. It features 39 preprogrammed lessons and 60 user defined lessons. Great sound, graphics and a real-time words per minute bar make improving your typing skills fun!

It is up to you to stop the invasion of the evil Quarriors and save Repton. You are armed with devastating Nuke Bombs, a Radar Screen, a Laser Gun and an Energy Shield. You'll need them all! You'll be attacked by Nova Cruisers and Single Saucers. You must avoid Spye Satellites and deadly Dyne-Beam Shooters and you must stop the Draynes from depleting the Reptonian power supply. Repton is a battle so thrilling you'll be relieved to find out you're still on earth when it's over!





Talk about adventure on the high seas! You're blasting away at a squadron of enemy bombers and Kamikaze fighters from the deck of your P.T. boat. Suddenly you notice the sea is loaded with mines and an Exocet missile is screaming toward you on the horizon. Instinctively you jerk the joystick to the starboard, keeping your thumb on the fire button. Phew! That was close! Sometimes it's hard to believe Wavy Navy's just a video game.

New Games For Your Apple II From Sirius™

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For more information contact your local Sirius dealer or distributor or contact us at 10364 Rockingham Drive, Sacramento, CA 95827, (916) 366-1195.

Editorial

FUN is more fun than ever

If we say so ourselves, we think this is our most exciting issue yet. First of all, there's an exclusive interview with Nolan Bushnell, who, if you don't already know it, is the man who founded Atari. Since he left Atari a few years ago, everyone wondered what he'd dream up next. Now we have the answer—robots—and EF naturally gives you the full story.

And as if that weren't enough, there's also our April Fool Contest. Scattered throughout the magazine are several items which are totally fictitious. Some are obvious, some are not, but you have to find them all to win. The prize? The cartridge of your choice. See page 8 for all the details.

Here's something that's not April Fool—we have been inundated with submissions for First Screening, our original program feature. Don't stop! We love hearing from all the budding game designers out there. We might have to expand the section. What do you think? Let us know.

Next month we're adding even more. Phil Wiswell, one of the country's most respected experts on video games—the author of several books and articles, and the creator of the videotape How To Beat The Video Games *from Vestron Video—will join us as a regular columnist and contributor. And Michael Blanchet's column on how to beat the arcade games will be doubled in size. Read EF every month and you'll be invincible!*

We also have three new editors on board. Kim Larsen has joined as copy editor, Michael Brown is the new associate editor and George Kopp is the new editor. All these changes are exciting for us, and for you it will mean more of what you want to read from the best video game magazine of all.

The Editors

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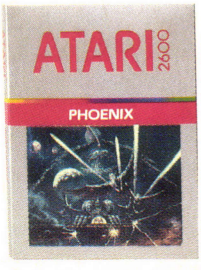
Which player's score is about to take flight?

Quick, figure it out. Here comes Phoenix* from Atari.

Duck. Here comes Phoenix. The famous arcade sensation that's now a home sensation. And it's only from Atari for use with the ATARI® 2600™ and Sears Video Arcade† systems.

This is a spectacular arcade replica. With four waves of awesome warbirds. Flapping wings that grow back seconds after you shoot them off. And even a forcefield.

But in Phoenix you can't just wing it. You can't shoot like the player on the left. Because he'll get only 100 points for a bird high in the sky. While the player on the right will shoot the same bird low in the sky for 500 points. And a feather in his cap.



So whether you aim high or low, aim to get Phoenix home. Any other idea is for the birds.

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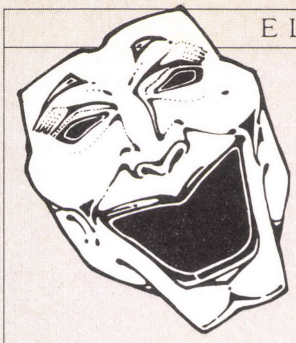
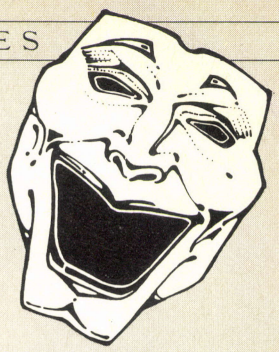
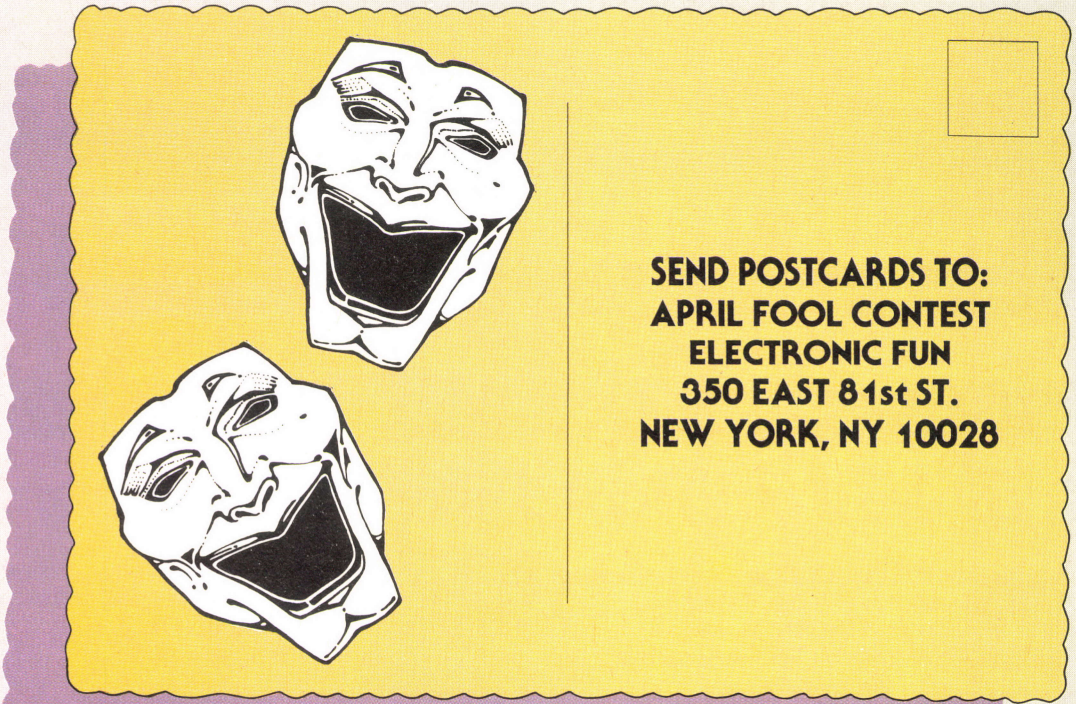




HA, HA APRIL FOOL!

We don't know about you, but we hate having April Fool practical jokes played on us. That's why we're getting the jump on things by playing impractical April Fool jokes on someone else first, namely you. Scattered throughout this issue of **Electronic Fun** are several fake items posing as facts. Can you locate them? We're not going to tell you which sections they're in or give you any other hints on how to find them. All we're going to tell you is how many there are. Five (count 'em, five), deliberately falsified items. Find them all and send in your guesses on a postcard (which must be postmarked no later than May 15). Be sure to include your name and address. Sometime in May, we'll hold a drawing from among all the correct answers and the first five people picked will receive the cartridge of their choice. A list of winners will be published in the July issue.

Good luck, and be careful. They've been hidden by experts and they're tough to find.



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Which player is heading for victory?

Better find out. Here comes Centipede™ from Atari.

Look out. Centipede's escaping from the arcade. Grabbing every great arcade feature it can. And it's only from Atari, for use with the ATARI® 2600,™ Sears Video Arcade† systems, and the ATARI 5200™ SuperSystem.

There's the same relentless attack of centipedes, scorpions, fleas, and spiders. A mushroom garden. Changing screen colors with each new centipede. And each new one gets faster. So points get tougher.

And if it's points you want, you can get 10 times more by shooting for the head. Like the player on the right. He's about to hit the head for 100 points. But the player on the left is about to hit a body segment for a measly 10 points. A cheap shot.

So don't let Centipede get away. That wouldn't be using your head.

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letters to the editors

HOME VERSUS ARCADE

Regarding the letter by Paul Dolimer asking that more space be devoted to arcade games, I hate to disagree but too many magazines

have diluted themselves by covering both subjects. Stick to home games and computer news. You may wish to put out another publication addressing itself solely to arcade games. There are two separate audiences.

Ron Landy
Port St. Lucien, FL

Only up to a point. Just about every arcade game these days gets turned into a home game and some of the hottest home games (Pac-Man, Defender, Frogger, Donkey Kong, *etc.) had previously been arcade games. We don't feel we can cover home games and ignore their source, the arcades.*

PADDLE US

In January's *Top Secret*, the Fly mistakenly said that the Atari Driving Controls are just single paddles. I have taken one apart to repair broken wires, and although outward appearance is the same, internal construction is somewhat different. As you may have noticed, the paddle controllers have stops to keep them from rotating 360 degrees, while the driving controls are free to rotate a full circle.

Derrick Hachtel
Mounlake Terrace, WN

WE'RE FIRED

The object of *Firebug* was not, as you printed, centered around "arsonists and their victims trapped in burning buildings." The Firebug character was described in our documentation as a "mechanical bug" that races through a five-level maze and attempts to destroy the maze with his trailing fuse. *Firefly* (new title) is a lot of fun. We at MUSE have never intended to offend anyone in any way.

Ronda Uretzky-Miller
MUSE Software

MORE QUIRKS

In *Yars' Revenge*, when you destroy the Qotile with your cannon, a line appears in the explosion. If you move up on this line a few times the letters HSWWSH will appear. This stands for Howard Scott Warshaw, the game's designer.

Glen Scott Friedman
Staten Island, NY

ODYSSEY THREE

Will Odyssey³ have a module that plays Atari or Intellivision cartridges?

Mark Giuliani
Long Island, NY

At the present time, Odyssey has no plans for such an add-on.

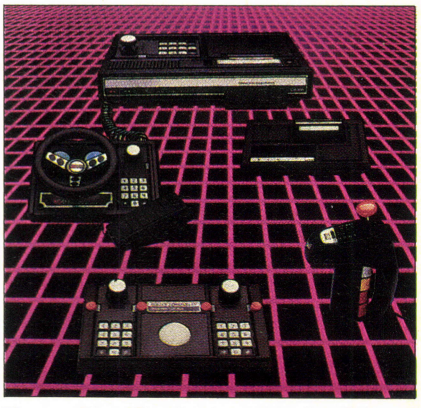
SECRET MESSAGES?

In your last issue you had an article concerning secret messages within games. Most of the "messages" were, in fact, malfunctions that would appear when turning the system on and off repeatedly. Exposing the system to this kind of treatment makes it susceptible to damage.

Alex Garcia
Deerfield, IL

TWELVE SECONDS

As I understand it, the twelve seconds of staring at "ColecoVision" on the screen is the time needed to load the program into the machine.



By reading the instruction booklet, you'd know you only have to press the * key on either controller to start a new game at that same skill level without returning to "ColecoVision" and the menu.

Michael Price
Columbia, MO

Write to us! We can't promise that we'll answer every letter, but we will read them all. We welcome your comments, advice and questions. Send your letters to: Electronic Fun, *350 E. 81st St., New York, NY 10028*

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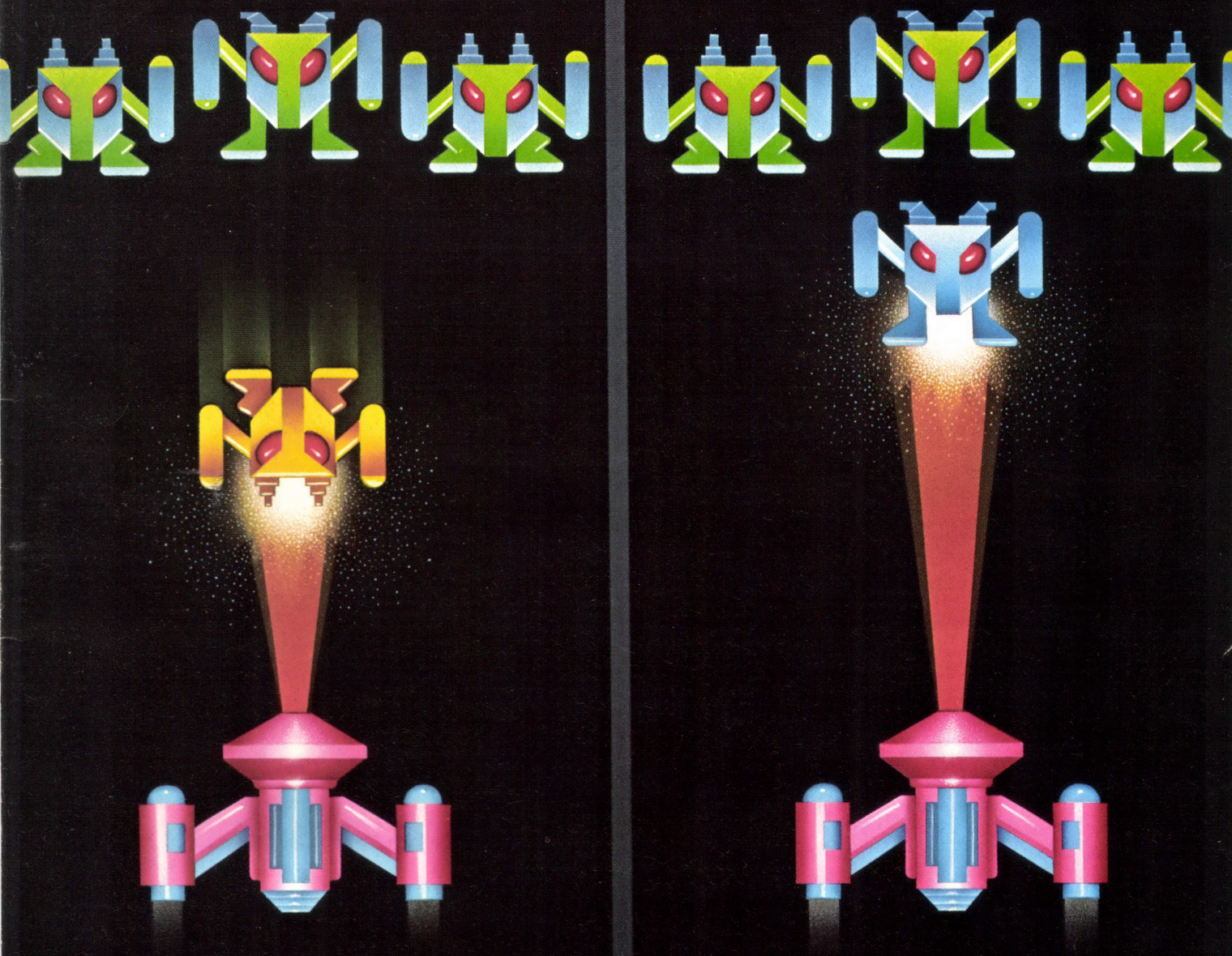

Which player is about to score with flying colors?

Better learn fast. Here comes Galaxian* from Atari.®

Pilot to co-pilot. Galaxian invaders are approaching your home. And they're only from Atari for use with the ATARI® 2600™, Sears Video Arcade† systems, and the ATARI 5200™ SuperSystem.

These Galaxians look, sound, and act no different than the Galaxians you've battled in the arcade. They swoop, dodge, and fire with equal cunning. So you have to know your stuff.

Like the player on the left. He's about to hit a flying yellow Flagship for 150 points. But his opponent, on the right, will score only 30 points for hitting the stationary blue Drone. Tough luck, rookie.

If you want to know even more about which Galaxians to hit, hit the stores for Galaxian.

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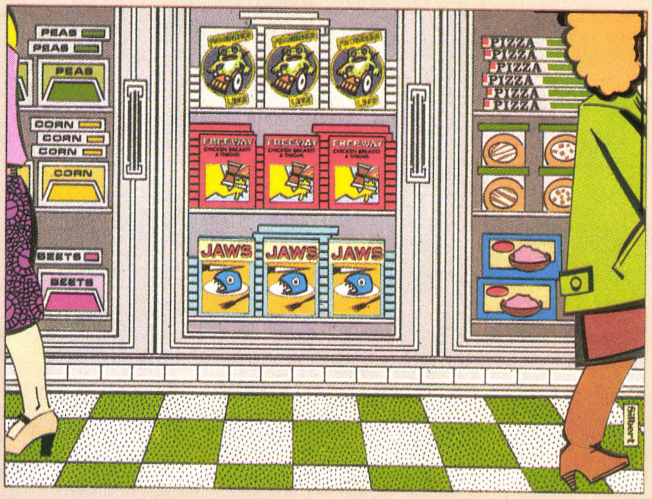
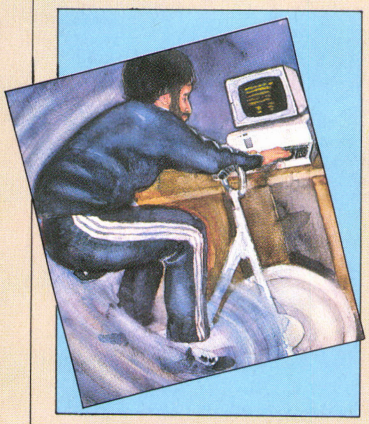
Working out and frozen games



Bytecycling

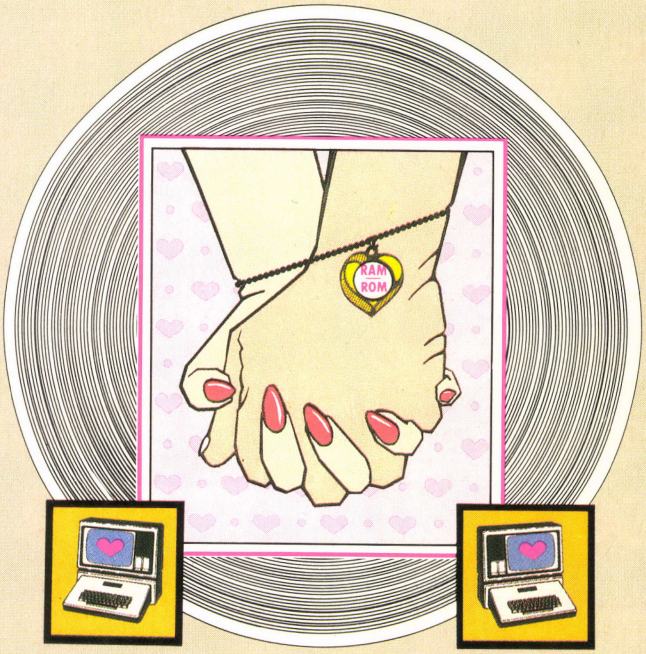
There are exercise programs and there are business application programs and, so far, the two have been incompatible. No matter how sophisticated an exercise program may be, there's no way you're going to get it into your disk drive and that's all there is to it. I'm sorry but that's life. And, as long as you're running your computer, you're not running—and that's not good for your health. But a San Francisco inventor named Nathan Edelson thinks that keeping fit and using bits can, in fact, go hand in hand. A computer user himself, Edelson



developed lower back pain from this sedentary activity and, consequently, set out to invent something that would eliminate the two biggest ailments plaguing computer operators: Back problems and anxiety. The result was Active Office, a cubicle which combines a computer terminal on an adjustable stand, an orthopedic chair, an exercycle and a treadmill. Okay. We can see how this takes care of lower back pain but what about anxiety? For this problem we've invented the Active Analyst's Office—complete with computer terminal with a beard and German accent, an orthopedic couch and a treadmill (for obsessive personalities).

Food and Games Part II

In the old days you went to the butcher for meat, the druggist for medicine, the greengrocer for greengroceries and, if there had been video games, you would have gone to the video game store for them. It was an era of specialization. Not any more. These days there are no clear cut rules about shopping. Especially when it comes to supermarkets. You find T-shirts in the snack food aisle, cold medicine with canned vegetables and saucepans in with the frozen foods. They're even selling video games in supermarkets, most notably, Shop-Rite. Yes friends, selected outlets in the Shop-Rite chain now carry video game cartridges from Atari, Coleco, Parker Bros., Activision, Imagic and U.S. Games. This could come in handy if, say, you wake up in the middle of the night with a craving for pickles and



River Raid. You can simply hop down to your nearest 24-hour supermarket and get it. We also have a suggestion for a new game that any company can snap up right now if it wants. *Supermarket Zaxxon*—a 3-D game in which you are given a certain amount of money and must buy as much as you can for that amount then battle with little old ladies to keep your place on the shortest line. It's a natural.

Let's Get Personal, Personal

Years ago the questions, "Who put the ram in the *ram a lam a ding dong*?" and "Who wrote the book of love?" were answered by The Monotones. The questions in today's personal computerized age is "Who put the RAM in etc?", "Who wrote the Love Application Program?" and, further, "Which computer is it

Snitches

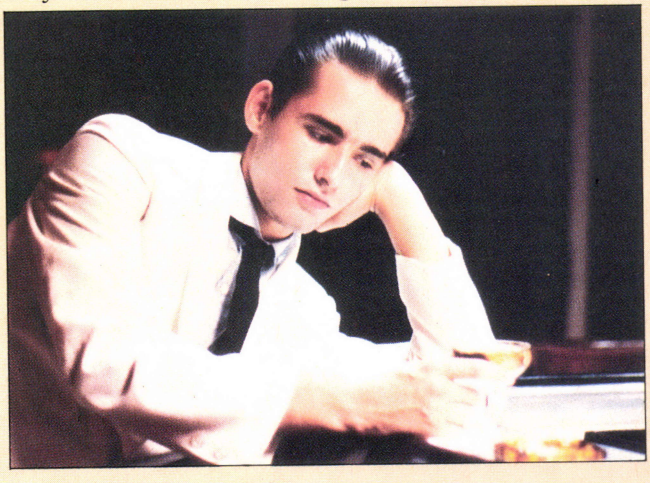
compatible with?" Well, none of these questions are, in fact, answered by the new single "BASIC Ain't the Language of Love" but it is, nonetheless, a song about love among the peripherals. Performed by recording artists Steve and Debbie Brown with a definite country/western rhythm and twang (or WANG), the floppy 45 tells the story of a hi-res couple headed towards divorce with a microcomputer as the co-respondent. Each one wants to pull the plug on the other's personal computer because, as the title says, "BASIC ain't the language of love." (The record is available directly from Reymont Associates, PO Box 273271, Boca Raton, FL 33427 for $5.00).

Apeus Corpus

It's been said that you're no one in the video game industry until you've been sued by Atari. But no one (not even Atari) can claim to have been sued by an entire state. Except Coleco. Wisconsin filed a $50,000 false advertising suit against Coleco for allegedly not providing the number of skill levels advertised for its Intellivision-compatible *Donkey Kong* cartridge. The civil damage suit was filed by Juneau County District Attorney Dan Berkos under Wisconsin's fraudulent and deceptive advertising statutes. Apparently, the television commercial for the Intellivision version promises three skill levels. But, says Berkos, there are only two. Berkos claims that the three screens shown in the ad are those on the CoelcoVision version. He wrote to the company but got no response until the suit was filed. At that time Coleco offered him $50. What the outcome of this unprecedented legal action will be one can only guess, but it is our opinion that this whole thing will go down in history as the 1980's update of the Scopes Monkey (or Donkey) Trial.

Have You Heard Atari Today?

There's a new form of home entertainment in town. It's called Atari and it isn't what you think. It's a musician. Really. And Atari is his real name. No kidding. Alexis Atari is 22 years old. Not only is the British-born Atari a dancer and fashion model, he also composes and performs electronic music. His current hit singles are electronic versions of "In the Mood" and "Give Me Some Lovin' " both available on Vanguard records. Although his PR people claim that Atari is poised to be the decade's "primo entertainer," in the event that he fails, he can always start his own video game company and call it, let's see . . . Mattel. Call it a hunch but we've got an idea that with a name like that he could go far.



Bill Silbert, Robert Casilla, Pat Kinsley, Jane Beaulieu

Stepping out with the Promqueen

VECTRIX

Color Graphics System $1,995

No, this is not a typo. There really is a company called Vec*trix* and the system makes hi-res color graphics affordable for the first time—if you have $2,000. The VX series includes two graphics processors, RGB monitor, printer and keyboard. It features 672 x 480 pixel resolution, eight simultaneous colors, 3-D vector graphics with rotation, scaling, translation, perspective, clipping, viewport and polygons. Additionally, it has serial and parallel interfaces compatible with virtually any computer. You can also mix graphics and characters using built-in and user-definable characters with variable zoom, slant, tilt and horizontal and vertical spacing. A new age of computer graphics is here.

Vectrix Corporation
700 Battleground Ave.
Greensboro, NC 27401

TECHNOTEL CORP

Radio Games $39.95

How many times have you wished you could play your video games on the street and listen to your favorite AM station simultaneously? Now you can, with Technotel's new pocket-sized video games and AM radios. *Emergency*, *Voyager*, and *Barrier* are three of the radio games available. Each features not only AM frequency but time and alarm capabilities as well as an LCD-type display gamescreen.

Technotel
1151 Triton Dr.
Foster City, CA 94404

WESTMARK

VideoPak Console Case $tk

The organization man has given way to video game organization. Videopak Command Console is a case that organizes everything from your console to your cartridges to your controllers. It fits the Atari, Intellivision and ColecoVision systems and doubles as a carrying case with a locking snap-on cover. Additionally, there is an optional leg module which converts the unit into a game table so you don't have to perch your system on your lap anymore.

Westmark
8181 Commerce Park Drive
Suite 708
Houston, TX 77036

J&A MARKETING COMMUNICATIONS

Video Game Album $2.75

Although they may not be as colorful or whimsical as record album covers, they are nevertheless covers—for video games. Made of blue vinyl, these video albums will store most brands of video game cartridges including Atari, Intellivision, Imagic, Coleco, Activision, etc. Each album has a three-inch label holder on the front cover, spine and back cover which can be used to hold identification labels or instruction manuals—if you haven't lost them!

J&A Marketing Communications, Incorporated
2717 East 42nd St.
Minneapolis, MN 55406

ZIRCON

Joystick Adapters J4024 $9.95

At last! Two, two, two controls in one! All of you who have complained that the ColecoVision controllers were inadequate and found that the Atari joystick—with its absence of a keypad—didn't really improve matters, give a cheer. The Zircon adapter

Gizmos

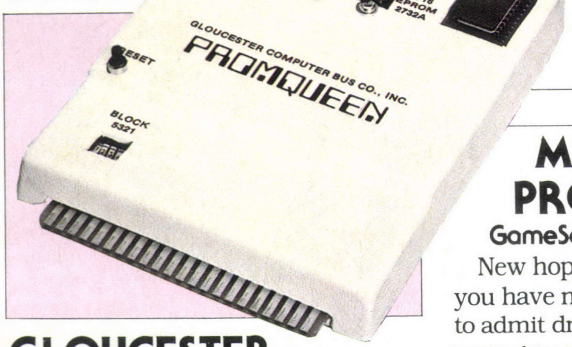
will permit you to use the Atari joystick and Coleco keypad at the same time. Hard to believe? Here's how it works. The unit plugs into the desired joystick and one of two ports on the ColecoVision console. A second joystick can also be adapted using the second ColecoVision port. Complaints—not necessity are the mother of invention.
Zircon International
475 Vandell Way
Campbell, CA 95008

DISCWASHER

PointMaster Pro $27.95

In calling its new PointMaster the PointMaster Pro, Discwasher does not mean that the first model was the PointMaster Amateur. In addition to features such as thumb-trigger firing button and hand-countoured grip (both found on the PointMaster), the PointMaster Pro offers a constant fire circuit for rapid fire performance and solves the problem of slippage once and for all with four suction feet which will adhere to any smooth, flat surface. The PointMaster Pro is compatible with both Atari, ColecoVision and the VIC-20 and Atari 400/800 systems.

Discwasher
1407 Providence Rd.
PO Box 6021
Columbia, MO



GLOUCESTER COMPUTER BUS

Promqueen $199

Despite the fact that the company's name sounds like a rapid transit system for mainframes, the product has nothing whatever to do with transportation—unless it's transports of delight. The Promqueen is a programmer's tool that will allow you to write in machine language, burn EPROM's and create your own video game cartridges for the VIC-20. Yes, your own cartridges—not disks, not cassettes, but bonafide cartridges. The system includes a ROM emulator which permits testing software in-circuit before actually burning the program into an EPROM (which, by the way, is what the inside of a cartridge is composed of). It offers 4K of RAM (about the amount found in most cartridges) for program creation and development.
One Blackburn Center
Gloucester, MA 01930
(617) 283-7719

MOUNTEBANK PRODUCTS

GameScreen $39.95

New hope for video game addicts! If you have more trouble than you care to admit dragging yourself away from your game system, perhaps you need some outside help. GameScreen can provide it for you. The GameScreen unit is a compact black box which, using a key and secret code, can be programmed to shut off your game system after an hour of gaming. Any

attempt to tamper with the unit will result in its shutting off altogether. This is a self-help product for those who are serious about cutting back the number of hours spent playing.
Mountebank Products
3757 Wilshire Blvd, Suite 202
Los Angeles, CA 90010

Reader's tips

GENERAL TIP

Before you try any game, watch other people play it. Don't keep your eye on the Pac-Man, the Q*bert or the central character. Watch the aliens or your enemy. See how they move. If you know your enemy, you can defeat it.

Troy Davidowich

PITFALL!

Pitfall! is a fun game. When you play, you should always go to the right. You'll get more treasures that way.

Steve Pallante

DONKEY KONG

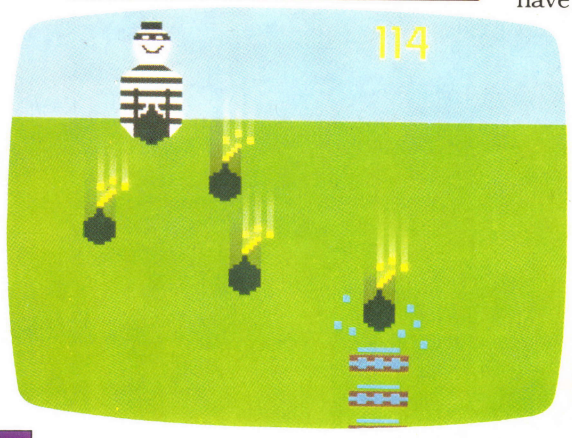
In the ColecoVision version, if you get right under the hat on the bottom floor of the rivet board and jump, the hat will disappear and give you 300 points. I don't know if Coleco intentionally added this to their cartridge or if it was a mistake.

Greg Wayne

DEMON ATTACK

Split the demon that's firing at you into two then shoot the one that's not firing at you. When you hit it, the other of the pair will dive and try to leave the screen at the bottom. Shoot him. He's worth the most points. Also, you might notice the next large demon won't drop down to fire at you until both of the pair are gone. You can use this to your advantage on the waves where the initial demons are very small. Since they are more difficult to split up, try hitting only one of the previous pair and, while his twin is diving, break up the next demon before he starts firing at you.

Terry Vaughn



KABOOM!

Don't catch every bomb! Drop the last bomb in the sixth wave on purpose. You'll rack up more points this way. I did.

William Rickel

TURBO

When cars go into the "valley" they disappear but they reappear in the same part of the road. If you see somebody go into the valley, steer to the other side of the road.

Bobby Winogrand

DIG DUG

Never drop a rock on a monster unless it has been stunned. Always go for the bonus food. Using this strategy, I have attained scores of 300,000 and higher.

Steve Taylor

ORIENT EXPRESS

I have discovered a way to get into compartment five without having to have a key. Aren't you jealous? Don't be. I'll tell you. When the border patrol boards the train at the Turkish frontier, give him the uneaten portion of the *pate* you picked up in compartment four. (I don't know why he wants it, but he always does). This will enable you to gain immediate access to compartment five as well as aid you in staying on your diet.

Ernest Frimbo

MS. PAC-MAN

Save the tunnel dots for the end of the board. You can scarf up all four, barely touching most of the playing field. At the start of the game, try to vacuum out all the dots on the lower half of the field first, because the ghosts (for some reason known only to them) head for the top.

Tom Keller

TEMPEST

When I play *Tempest*, I wear one of my mother's rubber gloves on my right hand. Usually my hand sweats and slips on the wheel, but with the glove I have a much better grip.

Nina Wallinsky

Do you have a tip for your favorite game? If it's good, we'll print it in Reader's Tips. *Send tips to:* Electronic Fun, *350 E. 81st St., New York, NY 10028.*

INTRODUCING THE SYSTEM CHOSEN 2 TO 1 OVER ATARI® AND INTELLIVISION® FOR REAL ARCADE GAME PLAY!*

Exclusive built-in screen for real arcade play - No TV set needed!
A revolutionary breakthrough! Only Vectrex delivers fantastic *real* arcade sights, sounds and challenge. Unlike Atari and Intellivision, Vectrex has a *real* arcade screen and sound system built in! No TV set needed! Real arcade controls too: a 360° self-centering joystick and four action buttons put power-packed fun at your fingertips!

An arcade full of favorites!
The fast-paced fun of *Mine Storm*™ is built into the Vectrex console. And for more *real* arcade variety, plug in Vectrex cartridges like Berzerk,** Scramble†, Rip Off‡ and Armor Attack.‡ Or choose exciting new Vectrex games like Clean Sweep,™ HyperChase,™ Cosmic Chasm™ and many many more. With still more on the way!

Convince yourself!
Compare the Vectrex Arcade System with any ordinary home video game system. You'll discover why most Atari and Intellivision players say Vectrex plays more like real arcade games than their own systems!

Vectrex™
Brings Real Arcade Play Home

THE VECTREX™ ARCADE SYSTEM!

*Based on a national survey among players of Atari® CX-2600 VCS™ and Mattel Electronics® Intellivision®. © 1982 General Consumer Electronics, Inc. All Rights Reserved. Atari® and VCS™ are trademarks of Atari, Inc. Mattel Electronics® and Intellivision® are registered trademarks of Mattel, Inc. ™Trademark of General Consumer Electronics, Inc. **Trademark of and licensed by Stern Electronics Inc. © 1980. †Trademark of and licensed by Konami Industry © 1981. ‡Trademark of and licensed by Cinematronics, Incorporated © 1980. Simulated picture of actual game play.

output input

Mattel plays arcade game

I live in Canada and I want to know something about the keyboard component for Intellivision. Is it a good computer? What are the characteristics, e.g. memory? Do you have any pictures of it? Let me say something else. Your magazine is one of the best on video games and computers.

Daniel Bisaillon
Montreal
(similarly Danny Tharp, Palo Alto, CA and Paul Ens, Saskatchewan)

There are two new attachments for the Intellivision and Intellivision II master components, both part of the new Entertainment Computer System. First, there's the long-awaited Intellivision Computer Adaptor which connects directly to Intellivision and Intellivision II. It has 2K of additional RAM which accounts for the enhanced graphics and 12K of additional ROM which includes a built-in BASIC language. A sound generator increases the sound channels to six and it accepts a whole new line of Intellivision peripherals. The unit has a 49-digit keyboard and can be programmed to perform any computer function. In addition, the keyboard allows the user to change any aspect of the games designed for it such as graphics, skill level and game action. Some of the games for the computer attachment include *World Series Baseball*, *Mind Strike*, *Scooby-Doo's Maze Chase* and *Astromusic*, a musical version of *Astrosmash*.

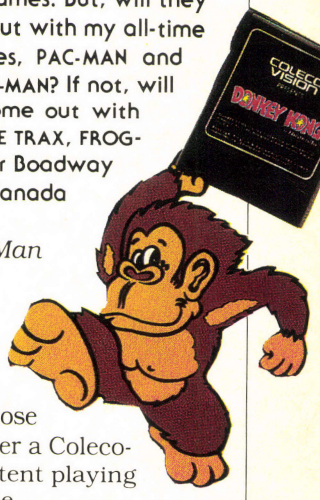
I enjoyed reading your new magazine ELECTRONIC FUN. I would like to know the addresses of the following companies to learn more about the field: Bally/Midway, Williams and Warner Communications.

Lloyd Weser
Whitestone, NY

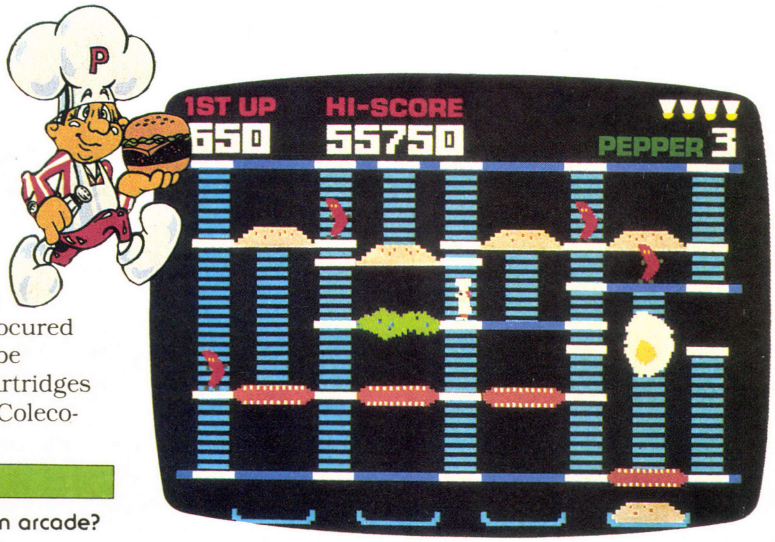
Okay. Here they are: Bally/Midway, 2640 West Belmont Ave., Chicago, IL 60618; Williams Electronics, 3401 North California Ave., Chicago, IL 60618; and the Atari Division of Warner Communications (which, Lloyd, is the division I think you're interested in); Atari Inc., 790 Sycamore Dr., PO Box 906, Milpitas, CA 95135. Warner Communications is a huge conglomerate incorporating DC Comics, movies and so forth. If you're interested in video games, then Atari is the branch you need to write to.

I recently bought a ColecoVision. I think it's great and Coleco has a good selection of arcade games. But, will they come out with my all-time favorites, PAC-MAN and MS. PAC-MAN? If not, will they come out with any of my other favorites such as MAKE TRAX, FROGGER or DONKEY KONG JUNIOR?

Blair Boadway
British Columbia, Canada



As far as *Pac-Man*, *Ms. Pac-Man* and *Frogger* go, I'm afraid Coleco will never be able to come out with a ColecoVision version of them. The licenses to those games are owned by Atari and Parker Bros. respectively and unless those two companies decide to put together a ColecoVision format, you'll have to be content playing them on the Atari expansion module.



Make Trax and *Donkey Kong Junior* are another story. According to Coleco, the rights to *Donkey Kong Junior* have already been procured for both the handheld version (which should be available now or within the month) and for cartridges for all three systems—Atari, Intellivision and ColecoVision. *Make Trax*, well, there are no plans.

What was the first video game built for an arcade? Who was the manufacturer and designer?

Bobby Hebert
Saugus, MA

According to our outside sources, the first arcade game built for an arcade was called *Computer Space*. It was designed by none other than Nolan Buhsnell and manufactured by Nutting Associates.

Why hasn't Mattel entered the arcade game licensing battle? In two years they haven't gotten the rights to any arcade games. How can they expect to remain ahead of ColecoVision which already has licenses with three companies. Also, has Coleco passed Mattel to take the number two spot and, if not, how long before they do?

Craig Miles
Winthrop, MA

As of now, Mattel *has* entered the arcade race. One of the games planned for release in 1983 is *Burger Time*. As far as what spot ColecoVision is in, most insiders agree that Mattel still has an edge but ColecoVision is gaining. But keep your eye on Intellivision's new master component Intellivision II and the keyboard add-on. We'll have to wait and see.

If Coleco makes DONKEY KONG for Atari, why aren't the graphics as good as DONKEY KONG for ColecoVision? And why doesn't the Atari version have a third (elevator) level?

Billy Landau
Chino, CA

The graphics are not as good because the Atari VCS simply doesn't have the memory capabilities that ColecoVision has. The more memory a machine has, the more sophisticated the game can be in both play and graphics. This is also the reason why the Atari version doesn't have the elevator level—not enough memory. Coleco says that all the cartridges they make are developed to use to the maximum whatever capabilities the hardware can accommodate.

The last time I was in my arcade I put two quarters on top of DEFENDER to reserve two turns. The kid behind me said I could only put one quarter on the machine. He got so mad he shoved me into the machine and the kid who was playing got eaten. Not only that, but both my quarters fell on the floor and rolled under the machine. Then there was a big fight between me, the kid behind me and the kid who got eaten. The owner threw us all out. My question is, I want my fifty cents back.

Peter Dalton
New Brunswick, NJ

We asked Michael Blanchet about the proper strategy for dealing with this one. He said, if the kid behind you is bigger than you are, *never* put down more than one quarter. As far as the quarters go, tough luck. Be happy your head didn't roll under the machine, Blanchet says.

I am considering buying a ColecoVision but I also want a full-fledged computer. How good and how much will the Coleco computer for ColecoVision be?

Robert Decker
California

Coleco says that the computer add-on will add 48K of memory to your ColecoVision console and will cost under $100.

Do you have a question about video games or computers that needs answering? Send your questions to: Electronic Fun, *350 E. 81st St. New York, NY 10028.*

THERE'S NO ESCAPING THE EXCITEMENT!

The human race has met its match!

The Beebots of Bem and their Killer Bees have invaded! Conventional weapons do nothing! Nuclear weapons do nothing!

Where do we run? Where do we hide?

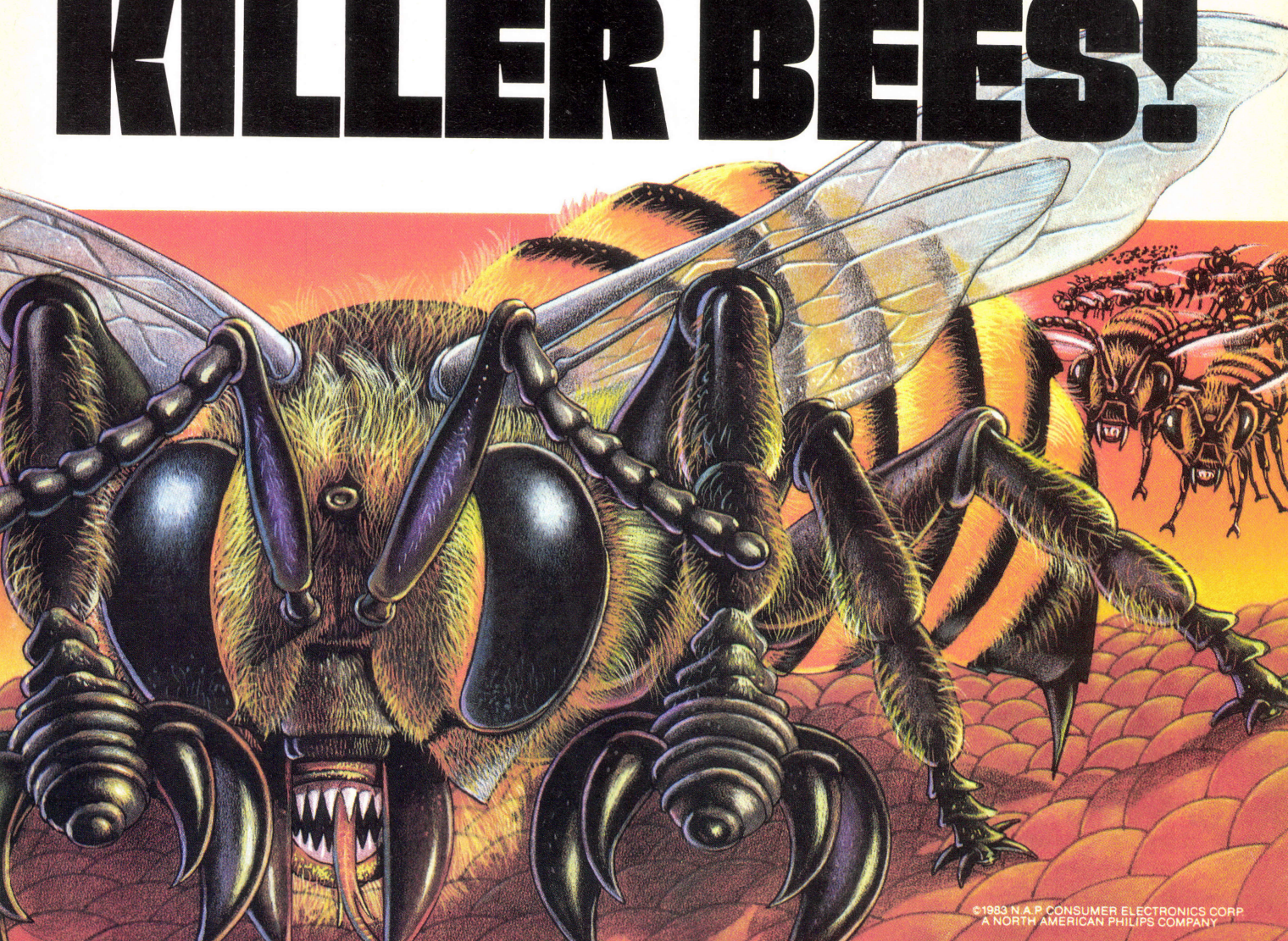
Saving the earth is in your hands!

Your only defense against the Beebots is the sting of your earth bees. Your only defense against the Killer Bees is your Rosha Ray. You have 26 different levels of challenge. Each one faster and tougher than the one before. High-level digital scoring with memory. Exciting sync-sound action when played through the Voice of Odyssey.® For one or more players—but players who can take it. The excitement is endless!

ODYSSEY

Over 52 games available.

WARNING... KILLER BEES!



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E.F.C. Times

VOLUME ONE, NUMBER SIX APRIL 1983

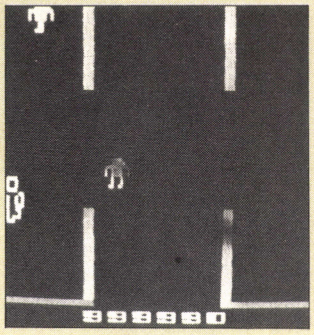
GAMES ARE GOOD FOR YOU

There's been quite a reaction in the video game community to the Surgeon General's slurs against our favorite pastime. Not about to take this lying down, a number of private research firms have undertaken the task of proving him wrong. The most recent study took two groups of rats and placed one in a closed room with the arcade version of *Super Zaxxon* and an endless supply of quarters. The other was placed in a room with the same game, but with no quarters at all. After 72 hours, the scientists found that the gorup with the quarters had gotten good at the game, routinely scoring 1,000,000 or more. In addition, a feeling of camaraderie developed within the group with several rats marrying and several more promising to "keep in touch" once the experiment had ended. The other group, however, became belligerent and resorted to name calling and general sulking. The conclusion is that video games are better for you than not having any quarters at all and that if you brush your teeth after every meal you're less likely to develop cavities.

ZAXXON: Source of good will among rats?

★★★ Monthly Contest ★★★

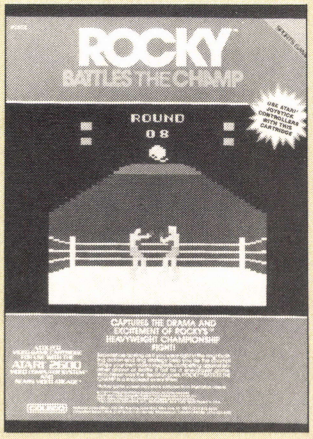
The winner of our January contest was John Somrod of Milwaukee, Wisconsin. John wins the cartridge of his choice for doing a lot of damage to *Berzerk*. This month . . . *Communist Mutants From Space*, by Starpath. The reader who sends us a clear photo of his or her TV screen with the highest *Commie* score by April 15, 1983, is the winner. Send entries to: *April Contest*, Electronic Fun, 350 E. 81st St., New York, NY 10028. Good luck! And don't use that flash! It'll wash out the screen.



Berzerk

Will Big Names Mean Big Games?

More and more, the video game companies are going for the big names. Coleco has acquired the rights to *Rocky*, *Wild Western*, *Frenzy*, *Mr. Do!*, *Pepper II*, *Looping*. Data Age, in addition to their much publicized *Journey Escape* game, plans to make games based on *Mr. Bill* (the hero of the old *Saturday Night Live*) and *Mr. T.* (Clubber Lang in *Rocky III*). DataSoft has licensed the TV show *Dallas* for comptuer games. Mattel has nabbed the arcade hit *Burger-Time* plus *The Jetsons*, *Magilla Gorilla*, *Quick Draw McGraw*, *Yogi Bear*, *Huckleberry Hound* and *Top Cat*. Odyssey will be making a home version of the arcade game *Turtles* and another called *P.T. Barnum's Acrobats*. Atari, last but not least, will be turning the Sesame Street characters, Mickey Mouse and the Peanuts comic strip into games.



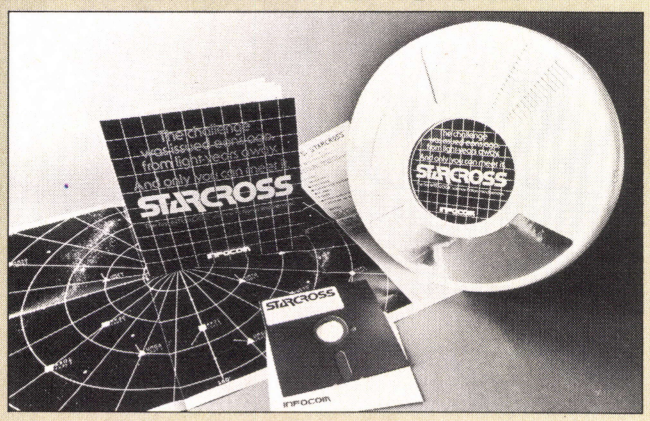
Coleco's Rocky

EF HAS A WINNER

Thanks to Noel Steere, one of *EF*'s regular reviewers, *EF* beat Phil Wiswell at his own game in a *Galaxian* play-off.

E.F.G. Times

ALL-PROSE GAMES FROM INFOCOM

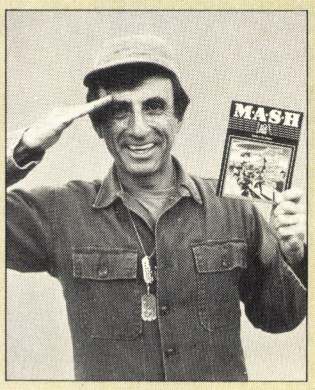


Starcross—*all-word space game.*

People are always talking about the graphics of video games and computer games. But at least one company, Infocom, makes games that rely solely on the printed word. Prose games such as *Zork*, *Starcross* and *Deadline*, put players in a verbal situation and let them type in their choices and solutions in complete sentences on the keyboard. In *Zork*, now in its third edition, you meet the Wizard of Frobozz in the Great Underground Empire where your destiny hangs in the balance. In *Starcross* you encounter helpful and harmful aliens in the 22nd century. Infocom's prose games are compatible with Apple, Atari, IBM, Radio Shack, Commodore, NEC, and Osborne computers.

Six For The 4077th

When Fox introduces a game, they don't fool around. *M*A*S*H*, their



Jamie Farr

new game based on the TV series that was based on the movie that was based on the book, will be released in six formats next month. If you own the Atari 2600, the Atari 400/800, the Commodore VIC-20, the TI 99/4A, Intellivision or ColecoVision, you're in luck. Jamie Farr, who plays Klinger, is the official spokesman for the M*A*S*H game.

One of our readers, Jan T. Miller of Hurst, Texas, sent us these little thoughts to brighten our day...

Fat Friend

We use to be impressed
By Super Heroes flying stunts.
Now the kids are spellbound
Watching Pac-Man eat his lunch.

Hooked

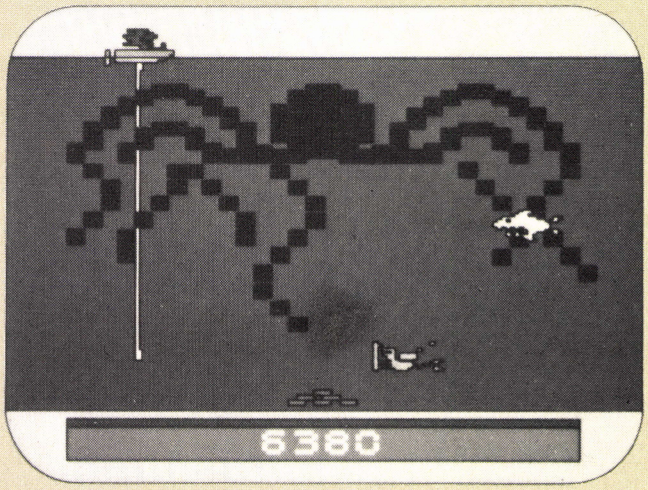
I bought a home computer
So my tax would not be wrong;
I hope by April eighty-three
I've tired of Donkey Kong.

Depreciation

Dad appreciates good grades
In dollars, which we earned.
But we'd settle for some quarters
For computer games we've learned.

Name The U.S. Game And Win

The name of this game is *Name This Game*. If you can come up with anything better, you should send it off to U.S. Games, because they'll pay you $10,000 if they choose it. In the game, you're a diver who has to protect a cache of treasure from a circling shark and a slowly descending octopus. The second prize will be $3,500, the third prize will be $1,500 and the fourth prize will be given to one hundred winners—six U.S. Games cartridges. Hurry! The deadline is April 30, 1983. For an entry blank, write to U.S. Games, 1515 Wyatt Dr., Santa Clara, CA 95054.



Atari Anyone?

If you like tennis but find that the news doesn't keep you up to date enough on who is the top seed, Atari has solved your problem. The Atari 800 is now the official computer of the Association of Tennis Professionals (ATP) and will be used to keep track of who's on top when. A constantly updated list of the top players will be kept online at all times covering tournaments played on all surfaces.

E. F. G. Times

TURN YOUR VCS INTO A COMPUTER

Atari VCS owners no longer need to toss their systems in the garbage when they're ready for a computer. A number of companies, including Entex and Unitronics, are coming out with devices you plug into the VCS to turn it into a 16K home computer. The Unitronics Expander will accept games on cassette tape which will sell for less than $15 each. The Expander and the Expander II (which will interface with keyboard) will be available in June with a price of $60 to $80.

Unitronics Expander

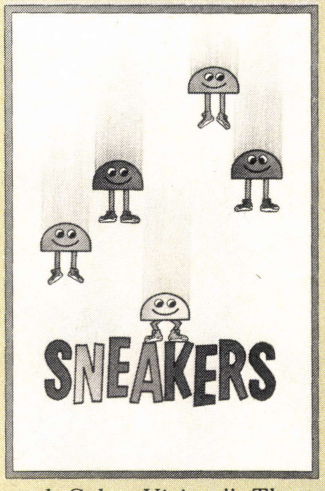
Commodore Software Spree!

Owners of the Commodore 64 ($595) computer are in for a field day. The company has announced the release of two dozen new software programs for 1983 that will be available on cartridges, floppy diskettes, and cassette tapes. Among the software will be two languages, two word processing systems, and electronic spreadsheet, mailing list, financial analysis, graphics plotting and music programs. The programs belong to the "Easy Software" series (EASYCALC, EASYSCRPT, etc.).

Also, cartridges for the Commodore Max Machine will fit the 64, so you can play hit games like *Gorf, Omega Race, Kickman* and *Wizard of Wor*.

Now's Your Chance! Be A Game Designer

Two companies are looking for games designers. Sirius Software, makers of such fine games as *Sneakers, Wayout* and *Wavy Navy*, is looking for "talented assembly language programmers and program submission for the Atari 2600, 5200, 400, 800, Apple II, Commodore VIC-20, 64, IBM-PC, Intellivision and ColecoVision." They also pay a finder's fee for discovering a new designer. RSVP Software is "seeking games with an original concept that will utilize the outstanding features of the Commodore 64."



How Good Are You?

Since video game scores are not standardized, a great score in one game may be just average in another. This is a problem, because it makes it difficult to determine what is a good score. But now, thanks to the American Video Athletic Association, we have a gauge —The Video-Tac Level Master. This chart will tell you how you rate in certain games.

For more information, write the AVAA at: *Badger Office Building, 120 W. Mifflin, Madison, WI 53703.*

	"DEFENDER"	"COMMANDER"	"INVADER"	"AVENGER"
Donkey Kong	10,000	60,000	120,000	300,000
Tempest	30,000	120,000	200,000	320,000
Pac-Man	8,000	35,000	80,000	300,000
Defender	12,000	50,000	600,000	2,000,000
Centipede	12,000	75,000	150,000	500,000
Frogger	6,000	20,000	50,000	100,000
Tron	5,000	50,000	100,000	500,000
Galaga	10,000	75,000	180,000	500,000
Missle Command	80,000	60,000	150,000	300,000
Zaxxon	7,000	25,000	80,000	300,000

Quote of the Month

"I thought *Donkey Kong* was something I stepped in."

Jamie Farr

Congratulations! It's a B.O.B.!

The father of video games has a new baby

The history of technology is full of a strange mixture of science and silliness. You can start with Archimedes, running naked through the streets of Athens shouting "Eureka!" after he'd made a momentous scientific discovery—while taking a bath. When Edison invented his "talking machine" he could have immortalized man's first recorded words by reciting Shakespeare, but no. Far from waxing eloquent on his wax cylinder, Edison ushered in the new era of sound by reciting Mary Had A Little Lamb.

Photo: Dal Rimple

By George Kopp

Nolan Bushnell

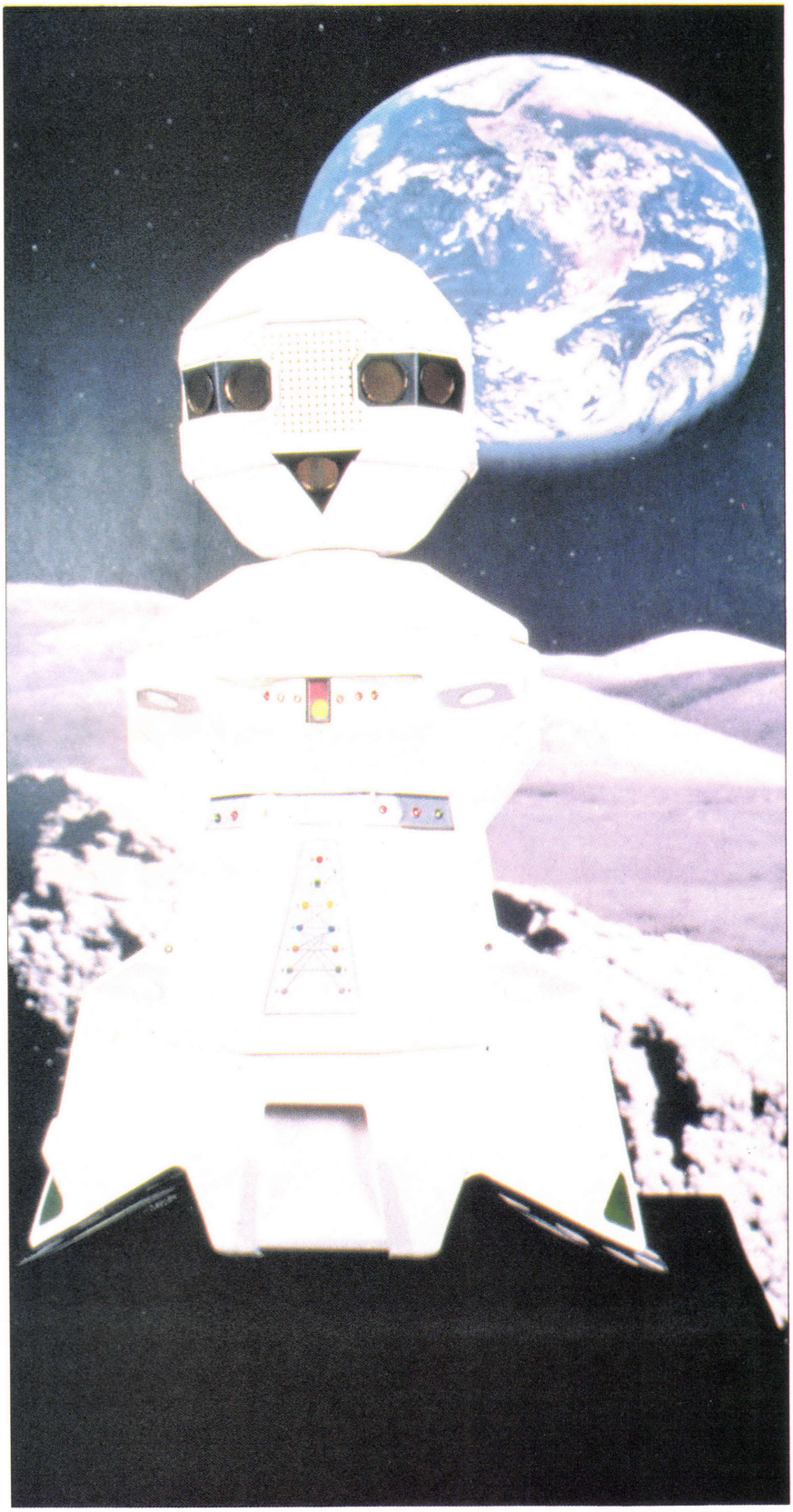
So when BOB made his first public appearance a little while ago, it was not too surprising that after walking to center stage with his rolling gait —or, since he is on wheels, rolling to center stage with his walking gait—his first words were also not Shakespeare. He said, "Hello, Nolan. Hello everybody. My name is BOB and I'm a day old. I'm very clever, but I don't *do windows.*"

BOB is a robot, or as his "daddy," Nolan Bushnell, would like us to call him, an androbot. He is a combination of android and robot, which sets him apart from all the industrial robots that build Toyotas and handle radioactive waste —machines with a lot of brawn and not much brain. BOB has a mind of his own.

A Living Legend

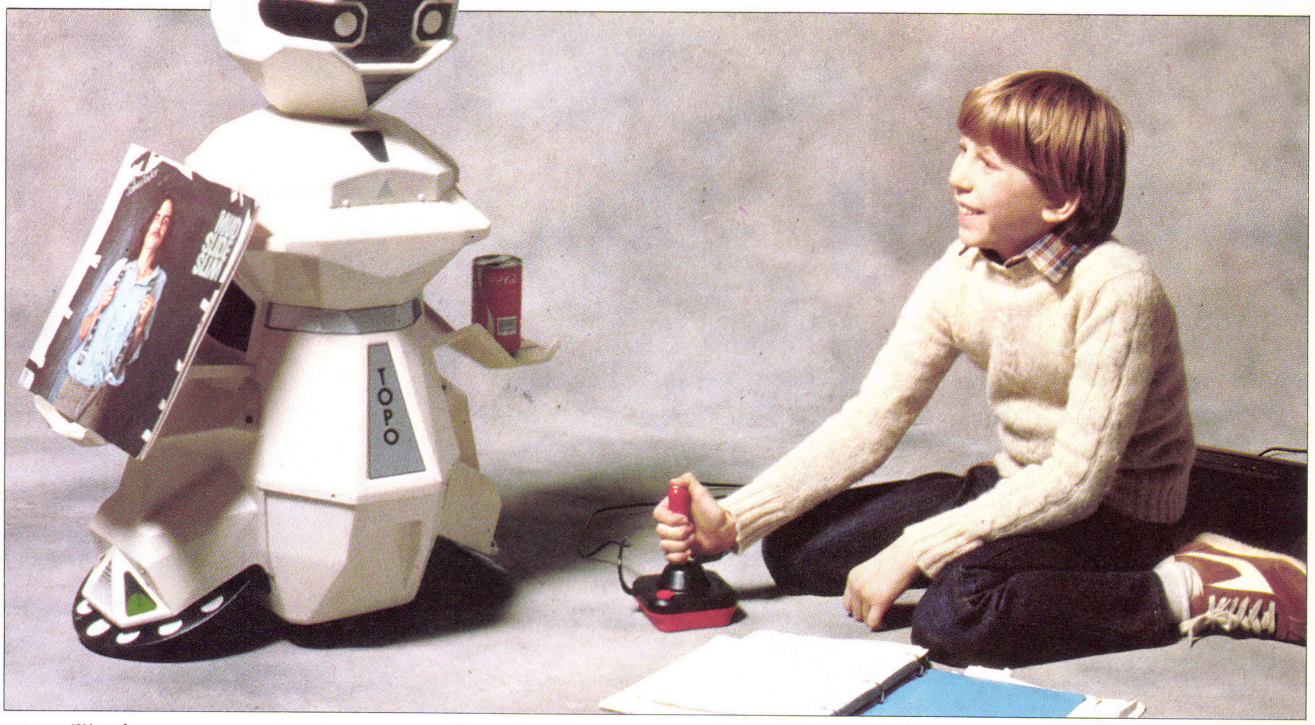
So, of course, does his creator. If Nolan Bushnell had a sidekick with a guitar, "The Ballad of Nolan Bushnell" would be on the Top 40. He's the man who invented *Pong*, who founded Atari, the new King of the Wild Frontier. For Bushnell, the Wild Frontier is now the field of robotics and artificial intelligence, and as crude as he says his robots are, Bushnell is happy enough with them that he is offering them for sale. For $2,500, BOB can be yours, and his little brother TOPO can hook himself up to your Apple II for a mere $1,000. By 1995, says Bushnell, the family robot will be a more important purchase than the family car.

"The nature of utility," he says, "and useful things in general, starts with frivolity. A lot of people don't make that connection. They don't realize that the automobile came about because it was a big gas. The telephone was considered



This is BOB, the brain-on-board androbot. On the facing page, TOPO and friends.

Photo © 1983, Androbot, Inc.



a toy. The home computer was considered a frivolity; the space program, too. The electric light bulb, every meaningful thing has to go through that step. And if you start with that premise . . . I mean, is that a bad way to approach things?"

Still, there's a serious—even awesome—side to BOB. Unlike the robots we've seen at shopping center openings and conventions, the kind who gather a crowd while some controlling "Wizard of Oz" hides behind a curtain, BOB is an autonomous thinking machine. Given the limitations of his programs, he decides for himself what to do and when to do it, and as he gets smarter (he learns as he goes along) he'll become more and more human. Yes, BOB is the prototype for C3PO and R2D2.

His name is an acronym for Brain on Body or Brain on Board—the people at Androbot Corporation are not sure which they like best. BOB's brain is as powerful as six Apple II computers. He's equipped wtih light and heat sensors and sonar, as well as a cassette player that gives him a voice. Since synthesized speech is still in the Stone Age, his inventors decided he would be far more appealing if he had a recorded human voice rather than one generated electronically. Right now, his voacabulary consists mainly of one-liners. BOB was designed for the sole purpose of being cute.

Alien Experience

If you have trouble with this, imagine yourself as a visitor from another planet where intelligent life forms do not have to grow up, but emerge in a fully adult stage with all their intellectual faculties intact. If you were to come to Earth and see cuddly little babies, you might have a hard time figuring out their role in society, or why adults respond to their every need. That's more or less the way Bushnell feels about BOB.

"An androbot can do anything, everything," he says, "but he's very, very young. He needs to grow up, and he will. I believe in the next few years, as a matter of fact, that the intelligence of an androbot—which is now in the neighborhood of six months to a year—will probably grow at a two to one speed. That is, he'll probably gain almost two years of intelligence for every year of manufacturing, until he's the equivalent of six to eight years old, intellectually." After that, certain "selective intelligence" capabilities will continue to grow—he'll be a whiz at math, for example—but in the area of what we might call "wisdom," he will not grow much, although Bushnell does not completely rule out that possibility either. There are still too many surprises in store.

Even at the tender age of a few months, BOB constantly amazes Bushnell and his colleagues in the Androbot laboratories. "We're finding that he's much less predictable than we originally anticipated," he says. "He's really starting to have personalities. For example, take the way he likes to search for things. Same robot, same program, same everything. One day he'll come into the room and he'll sweep wider, or

favor the left, or favor the right—just different ways of dealing with things. That's when you start loving the little bugger."

Building an artificial intelligence machine is not like building a simple computer. No matter how quick they are, computers are essentially apathetic—they couldn't care less what's out *there*, just what you feed them in *here*. But to give a machine intelligence, you have to build in something that's still a mystery, even in humans—curiosity.

What's it like being BOB? That's something the Androbot engineers ask themselves all the time. Bushnell has tried to put himself on BOB's wheels mentally. "It's dealing with a world in which you have a rubber stick on a starless, moonless night. You have perceptions of objects, and you test and feel, but it's still a rubber stick, so you never have firm data. We're doing more work like that with BOB, trying to blot out our cognitive powers. We'll carry him into a strange room, and the information he's getting will come on the screen. Instead of saying, 'How do *we* deal with this,' we'll just work with what he gives us. You have to do it that way, almost.

"People often look at the sensors and say, 'Well, that's pretty easy.' It's not, really. He's getting a tremendous amount of garbage information. Humans learned to disregard that a long time ago, but BOB still has to learn what to disregard and what's real information. He has to get a feel for what's out there, and make each decision based on that feeling."

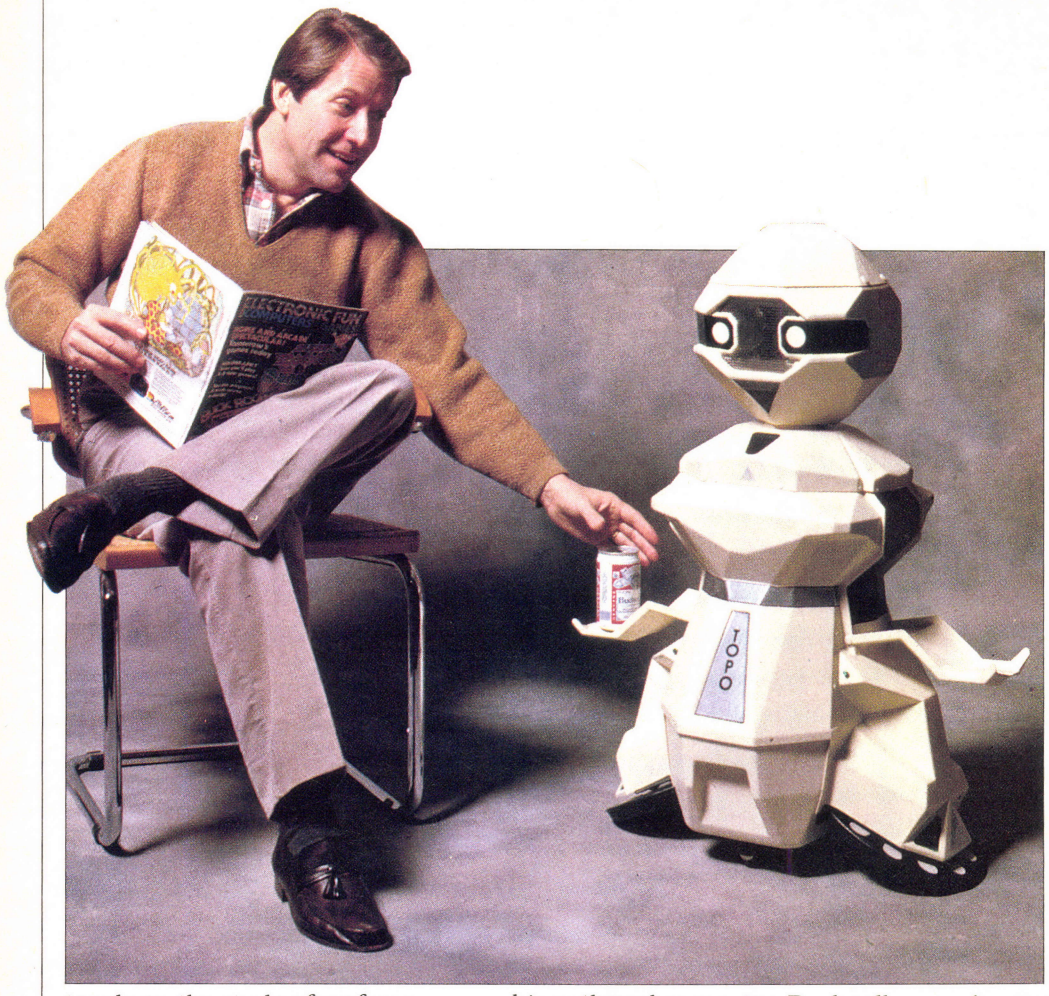
In the beginning of his work with robots, Bushnell says he had a problem with saying things like, "BOB likes to do it this way." Now, he says, he's quite comfortable with those phrases, and even believes they are scientifically valid. "For all we know, what we call 'personality' is in fact the same thing as what these creatures with artificial intelligence display. The reality is, we should start to deal with them as autonomous creatures right now."

"Something Else"

It's not that he's experimenting with which way works best, says Bushnell. "There's something else going on. There has to be, because the learning aspect of the programs are not that well honed at this point. We're seeing real artificial intelligence." If that sounds like a contradiction in terms, it's probably one we're all going to have to adjust to in the near future.

Unlike BOB, the other Androbot creation, TOPO is the slave of an external master. In his case it's an Apple II, although a version for Atari, Commodore and the Timex Sinclair computers isn't too far off. TOPO's name comes from

TOPO will play games, help out around the house, entertain at parties, help with your homework, and unlike your little brother or sister he won't go through your room and mess up your stuff. You control him with a radio joystick hooked up to a computer, or he'll follow a program.



topology, the study of surfaces, since moving around on them is one of the things he does best. Both BOB and TOPO ride around on two obliquely mounted wheels. This carriage assembly causes them to rock as they move, but otherwise affords them an impressive degree of stability. The Androbot designers believe that a stair-climbing robot will have to have a spider-like, six-wheeled carriage.

TOPO is connected to his outboard computer by a radio transmitter—the same kind used to control model airplanes. You can either program his movements into the computer and let it run, or control him directly with a radio joystick. It would be a simple matter, for example, to program TOPO to patrol your apartment while you were out. Fitted out with a burglar alarm or a smoke detector he'd make a very efficient security guard, and he'd never ask for a night off.

Obviously the King of the Wild Frontier is not interested in the home security business. Even with his outboard computer, Bushnell says, "TOPO is going to end up becoming much more like BOB. What we have here is something that has most of the capabilities, intellectually, of a very, very small child. So there are all sorts of interesting games that can be played. Hide and seek, for example. I know people don't like war games, but you could equip TOPO with a little light pistol. You wear a medallion and he wears a medallion, and you run around the house trying to see who will get the other guy first. Couldn't you see people like Activision coming out with a hide and seek cartridge for TOPO?"

Lots Of Personality

BOB, meanwhile, will have multiple cartridge capabilities, or as Bushnell puts it, "multiple kernels going on at the same time. That will make him smarter than any Apple or IBM or any of the small computers. You'll be able to change the randomness—make him aggressive or passive—and he'll play the game much differently each time. You find some funny things when you get into artificial intelligence. Take hide and seek. Does he go as fast as he can and look everywhere, or is he very pensive, trying to correlate all the data that he has?"

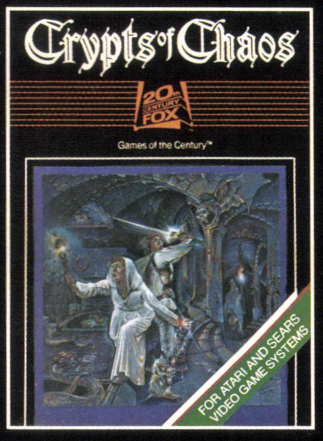
In addition, there are all the learning applications the androbots can be used for. When you buy your TOPO, you'll be able to get a voice module for another $200. Program your Apple to instruct you in the multiplication tables, or French, or Assyrian paleography, hook it up to TOPO, and you have a dandy teacher who's much more fun than a boring old TV screen or a strict professor who does a lot of yelling. Add some voice recognition a couple years down the road and you might forget you're talking to a computer.

Somehow, though, the "beer program" is the one that seems closest to Bushnell's heart. In fact, while he says he is willing to let someone else design what will be the VISICALC for the androbot—and make the designer $100 million—Bushnell is saving the beer program for himself. What is the beer program? What else? As you sit comfortably in your chair watching Monday Night Football, TOPO or BOB will go to the fridge and get you a beer.

As he gazes in rapt admiration at his androbots, Bushnell says, "Look at those things. I'd almost like to put an Atari VCS with a 12-inch screen over there, let 20 kids come in, and see which one they play with. I mean, I know the answer. But before I get too carried away—the real thing about these guys is that Dad's going to want his robot. Dad really, seriously, wants to be waited on."

Continued on page 96

IF STRATEGY ISN'T YOUR GAME, CRYPTS OF CHAOS WILL EAT YOU ALIVE.



It took the master at Fox video games to create Crypts of Chaos—the new strategy game that would challenge the mind of a sorcerer. It's a dark fantasy world of wondrous wizards and terrible trolls. There is treasure there. But to win it you will have to be very very clever. For it's guarded by dragons. And they have had their fill of witless players.

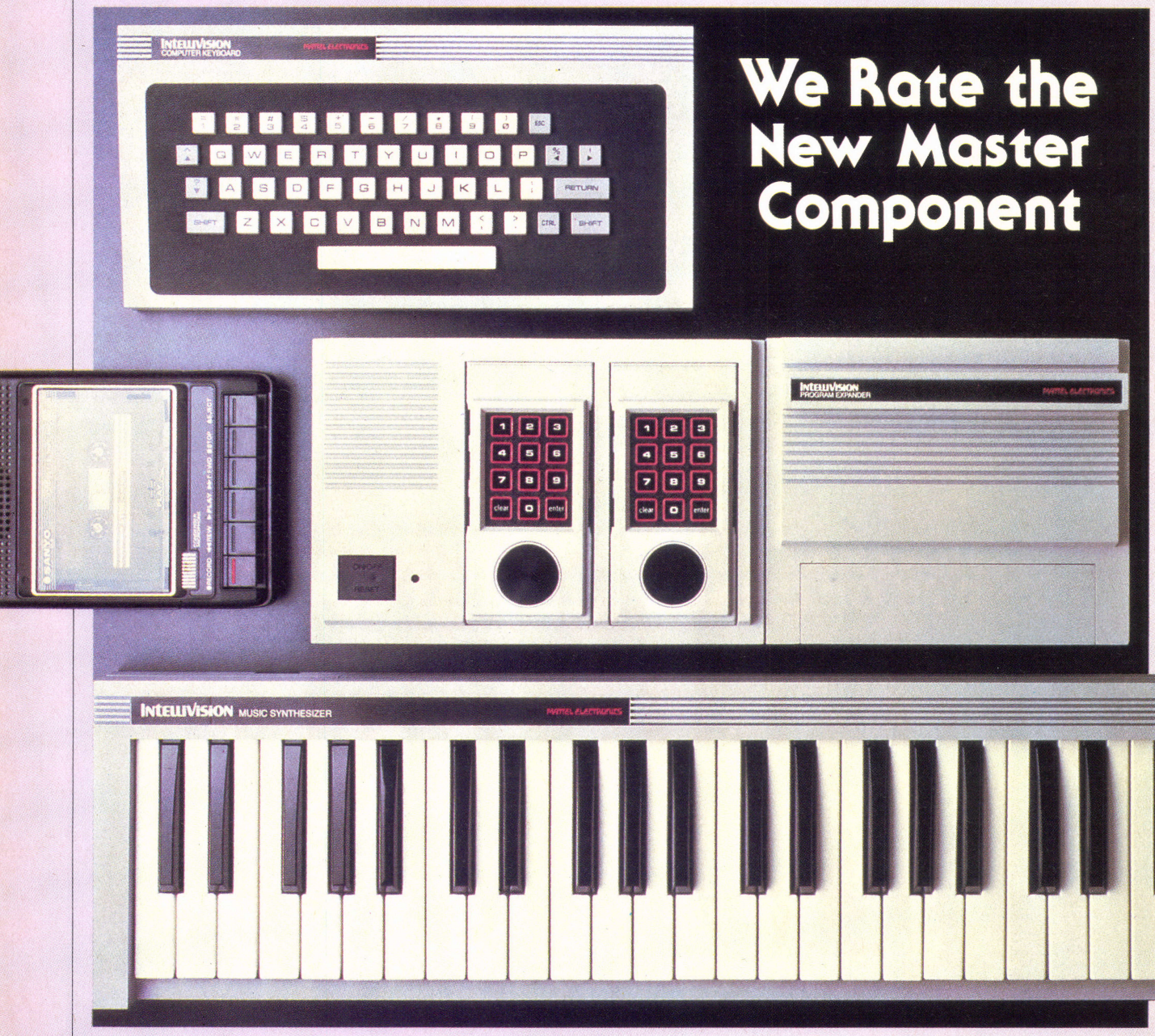
FOR YOUR ATARI VCS.

20th CENTURY FOX™

Games of the Century

GAME WORKOUT

INTELLIVISION II: The Sequel



We've waited and waited and here it is at last . . . Intellivision II and its array of peripherals and add-ons. You Intellivision owners can stop biting your nails, though. It's all compatible with the original unit, right down to the computer adapter and game cartridges.

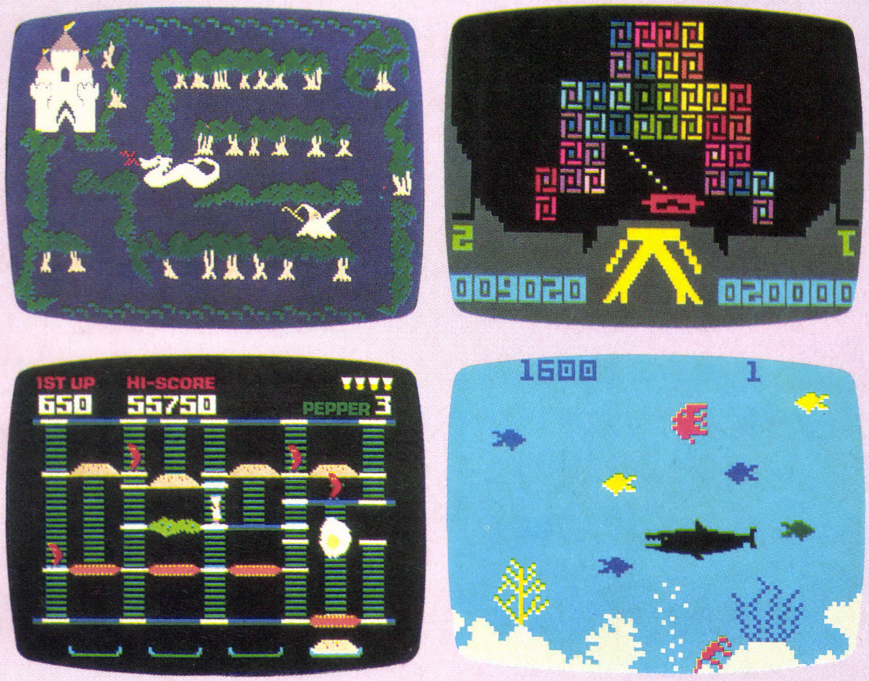
So why a new Intellivision? For one thing, it's spiffier than the original. For another, what better way to entice owners of other systems—and those who don't own any system at all—to switch to Mattel than by offering something new? Here's your chance to be first on the block all over again!

By Michael Blanchet

When Mattel introduced Intellivision a few years back, its high list price (around $250) probably scared off more than one potential purchaser. Since price was the deciding factor in the buyer's mind in the early days of video gaming, the cheaper Atari VCS got the lion's share of the market. Zeroing in on the gamer's insatiable craving for sophistication and his purse strings, which are now tighter than ever, Mattel has reissued the Intellivision console. In keeping with the parameters of a true sequel, the set has been christened, what else but Intellivision II.

Gasp! Does this mean that Mattel is forsaking all those present Intellivision owners who put their trust and dollars in the words of George Plimpton? Fortunately, no. Intellivision and its upgraded counterpart are identical in as far as compatibility of software is concerned. The new set will merely supersede the old on retailers' shelves. The main differences are the size, look and the price. According to Mattel exec Peter Pirner, the new master component "will probably retail for well under $200." The original currently sells in the $150-$175 range, thanks largely to the generous rebate offer.

The new console is more compact than the first. Its grayish body, well accented with red and flat black trim, makes it look more like a sophisticated electronic device than a piece of Chippendale period furniture. Its smaller size also guarantees that it will not dominate your living room to the extent that its predecessor did.



New; (clockwise, top left) ARCTIC SQUARES, VECTRON, SHARK SHARK, BURGERTIME

A Face Lift Isn't Enough

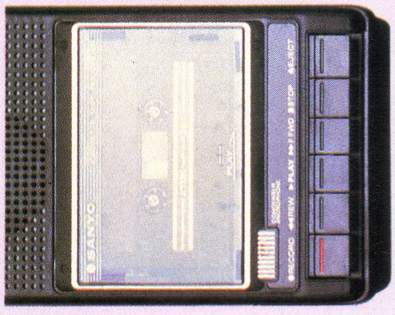
A face lift is all well and good, but this alone doesn't necessarily mean the gamer is getting more value for his dollar. Electronically, the set remains unchanged. Intellivision II uses the same 16-bit microprocessor found in the original master component. The improvements (if you can call them that) are physical design changes to tailor the machine to the needs of the player.

The on/off/reset switch combines all three of these functions into one button. Positioned prominently in the lower left hand corner of the console, this is a definite improvement over having the reset on the hand controller keypad. As a reminder for gamers who tend to leave their sets burning through the night. It has an on/off indicator light.

Where Intellivision could stand some real improvement is with its game controllers. Die-hard Intellivision owners, after much practice, are probably accustomed to the quirks of the infamous disc controller, which requires the nerves of

a diamond cutter and the hands of a brain surgeon to operate accurately. It is with much sadness that I report that the same keypad disc controllers are included with Intellivision II. At least they are now detachable, so if they malfunction you won't have to ship the entire console back for repairs.

Since the controllers are detachable, Intellivision is now fair game for the growing number of replacement controllers currently flooding the market. Though no one company has announced plans to develop an Intellivision II replacement controller, Discwasher—which currently offers the Pointmaster, an Atari VCS replacement stick—hints that it will have controllers available "for other systems" by June of this year. Mattel also plans to offer its own joystick for Intellivision II, complete with three-and-a-half-inch shaft, top mounted firing button, and



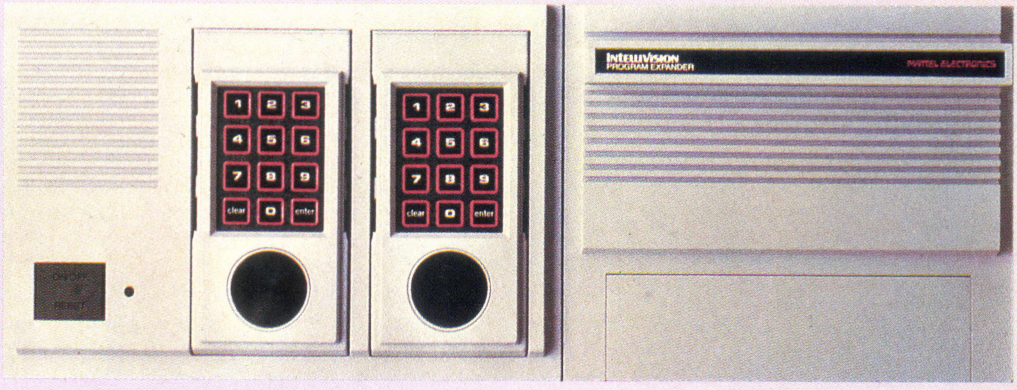
four side action buttons positioned on the base of the housing. According to Mattel the joystick can be used in conjunction with all Intellivision games.

Early Intellivision games, such as the sport and strategy offerings, required the player to punch in special codes via the keypad during game play. To some, this is sophistication in gaming. To others, this system is a burden—an unnecessary step that hampers the continuity and flow of game action. It is not uncommon for a first-time Intellivision user to spend more time looking at the keypad and the instructions than the TV screen when trying to learn a game. The current trend in Intellivision-compatible software—games staged in real time—means that the play action is no longer dependant to a great degree on the keypads and the esoteric codes. So I'm puzzled why Mattel went with the keypad and disc controller this time around when the joystick is clearly the superior device.

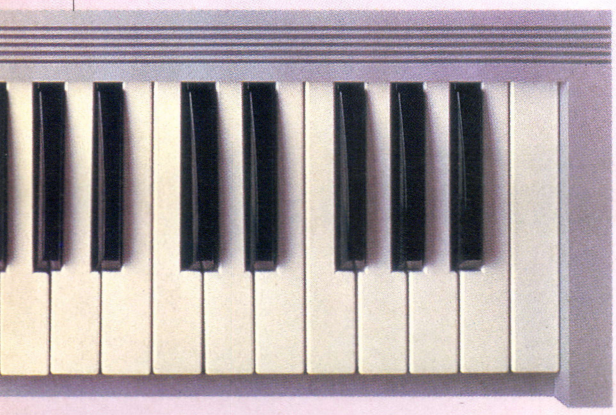
Peripherals Galore

Aside from being detachable, the new controller also has a longer cord, and the controller storage area in the console has been enlarged.

For expandability and long life of the hardware, Intellivision II ranks high by virtue of the many peripherals and add-on modules Mattel now offers. The Intellivoice speech and sound effects generator, which was introduced last year, makes sound and speech an integral part of game play. It too has gotten the cosmetic once-over. It's now grayish and boxlike and features a built-in volume control.



For the Atari VCS owner looking to upgrade to Intellivision II, Mattel now offers incentive in the form of the new Expansion system A, which makes all VCS compatible software usable on the new Intellivision console. The unit plugs into the Intellivision II cartridge receptacle and the VCS cartridge is then inserted into the expansion module. Positioned in front of the cartridge receptacle is a bank of switches which control the reset, left and right difficulty and game select functions. Two controller jacks are also included so that VCS owners can interface the joystick or paddle controller they currently own. Like its ColecoVision counterpart, Expansion System A neither improves nor dulls the graphic quality of a VCS-compatible game; it merely serves as a translator. The original Intellivision (model #2609) will require a factory adjustment before Expansion system A can be connected and operated, but information regarding the nature or cost of the adjustments was unavailable at presstime.



As promised years ago, Mattel has finally introduced a computer keyboard add-on for Intellivision. The keyboard is just one of the many peripherals that comprise the Intellivision Entertainment Computer System package.

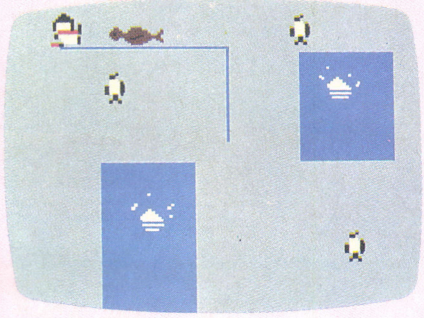
Phase One of the Entertainment Computer System is the computer adapter and the keyboard. The adapter features built in BASIC, 12K of ROM, plus 2K of additional RAM that expands the memory and sound-generating capabilities of the Intellivision II master component from three to six channels. The keyboard has forty-nine full stroke keys—that is, it is not a membrane keyboard like the ones used on the Atari 400 computer and the Odyssey² mainframe, but one that resembles a typewriter.

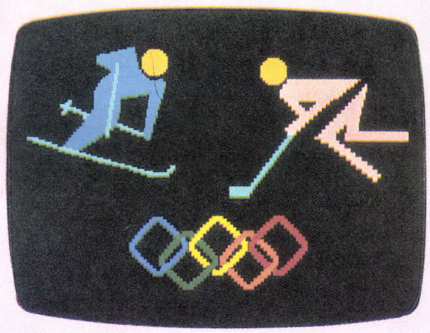
No-Boredom Keyboard

According to its maker, the keyboard promises to add a new dimension to video games. The computer keyboard can supplement the hand controllers by allowing the user to change different aspects of a game, such as the graphics or the skill level. To what extent the user can initiate change in a game's program is not clear at this time, but by virtue of the computer adapter's added memory, the games will be more complex in appearance and play action. With two additional hand controllers, four people can play at one time. The extra controllers plug into the system's computer adapter.

If you own an Intellivision now, the computer keyboard will work with your machine. If you don't own an Intellivision but are thinking of buying another game system, you would probably want to test-drive the keyboard and the games available for it before deciding.

World Series Baseball, for example, which is the game George Plimpton has been previewing on TV, is just as spectacular as it looks in the commercials. It doesn't put you in the ballpark—it puts you in your living room watching the Game of the Week. Screen One is the home plate camera, with an over-the-ump's-shoulder view of the pitch. When the batter makes contact, the screen follows the flight of the ball. Then another view takes over as the fielder makes the play. If your man should make it to first, you get a split screen effect so you can follow the pickoff action at first base.





Sheer Willpower

The version we played was still undergoing some refinements. According to Mattle, the fielders, who threw the ball with what must have been sheer willpower, will actually hurl it in the final version.

The computer keyboard isn't the only keyboard available with the Entertainment Computer System. The Intellivision Music Synthesizer, when connected to the computer adapter, allows the user to write original compositions or learn to read sheet music. Prepare for a surprise, because this keyboard is nothing like the small, self-contained music-making machines currently on the market. The Intellivision unit has 49 standard piano-sized keys, making it suitable for serious musicians.

Some innovative software from Mattel will amke learni music as mcuh fun as playing a video game. In fact, they have managed to incorporate gaming into the learning process through a cartridge called *Astromusic*, which is the musical version of one of Mattel's most pop-

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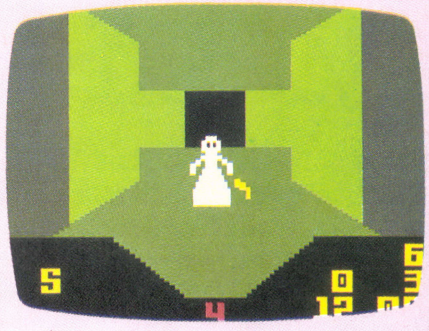

Three more new games for Intellivision II (and Intellivision) include MYSTIC CASTLE and OLYMPIC, shown on the left, and another adventure game TREASURE OF TARKIN.

UMI software...a world of choices

A World of Fun! They're hot! They're new! The exceptional graphics and challenging play of UMI's games have made United Microware the leader in arcade-quality recreational software.

A World of Help! UMI has created programs to help professionals and homeowners "take care of business." UMI can make your life a little easier with word processing, information storage, financial management, hobbyist programs, utilities and communication programs — all with easy-to-understand instructions.

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ELECTRONIC FUN MAGAZINE'S

top 10

HOME

1. PITFALL! (A) (Activision)
2. RIVER RAID (A) (Activision)
3. FROGGER (A) (Parker Brothers)
4. DONKEY KONG (A) (Coleco)
5. DEMON ATTACK (A) (Imagic)
6. DEFENDER (A) (Atari)
7. PITFALL! (I) (Activision)
8. REALSPORTS FOOTBALL (A) (Atari)
9. SPIDER FIGHTER (A) (Activision)
10. RAIDERS OF THE LOST ARK (A) (Atari)

ARCADE

1. JOUST (Williams)
2. MS. PAC-MAN (Midway)
3. Q*BERT (Gottlieb)
4. SUPER PAC-MAN (Bally)
5. JUNGLE HUNT (Taito)
6. MOON PATROL (Williams)
7. GALAGA (Midway)
8. CENTIPEDE (Atari)
9. DONKEY KONG (Nintendo)
10. DONKEY KONG JR. (Nintendo)

The arcade Top Ten courtesy of REPLAY MAGAZINE, the coin-op Bible. The list of Top Ten home games is the result of an independently conducted survey of retailers across the country. (A) indicates Atari VCS while (I) indicates Intellivision.

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A game is BORN

From inspiration to installation

In most firms, anyone who regularly sneaked away from the office during working hours would soon be consigned to the unemployment line. At Rockola, a manufacturer of coin-op video games, however, such behavior is welcome. "One of the best indications we have that a game we're developing is a success is if people in the company spend as much time as they can playing it," explains Larry Gleason, manager of electronic engineering. "In fact, we'd worry if no one flocked around it. It's even a good sign if they kick the machine and swear at it, because that means they're getting very absorbed in the action."

By David Tuller

Illustrations: Michael Okamoto

Naturally, every arcade company would like to produce games with a hypnotic draw; games that wheedle quarter after quarter out of your pockets and games that make you kick and swear at them. That's why most of them employ designers to come up with games that will do just that. But video games do not emerge full-grown from the minds of their designers. So where do they come from? Not cabbage patches and they certainly aren't carried in doctors' little black bags either. The process from first inspiration to final installation in your neighborhood arcade can take anywhere from six months to a year or even longer.

And it is not generally an easy birth. Most games undergo such a laborious process of refining and testing and refining once more, that the final product often bears little resemblance to the initial concept.

First there's the idea. A number of arcade games are based on well-known Hollywood feature films such as *Tron*. Others are licensed games which were developed abroad—*Pac-Man* for example, gulped its way across the Pacific courtesy of Midway, which picked it up from Namco, a Japanese manufacturer.

Most ideas, however, are generated in-house and many companies are open to suggestions, not just from programmers and engineers but from receptionists and outsiders, all the way up to top-level executives. Exidy, for instance, had held contests to see who could come up with the most innovative game concept. And Atari employees often leave the office for brainstorming sessions.

In the beginning was an idea. And the designer saw that it was really neat, so he created good guys, bad guys, laser blasters. On the second day he programmed and wired him a circuit.

The criteria for judging an idea have changed drastically over the years. Most game makers try to steer clear of the alien shoot-'em-ups that dominated the business for so long. Sure, *Space Invaders* was great but everyone—including the most fanatic gamers—needs a change of pace now and then. The emphasis, therefore, is on new worlds to conquer and not on recycled variations on a single theme. Programmers now look to the unusual as well as the usual when brainstorming ideas for new arcade games. Almost anything goes—from the common to the uncommon. In fact, many of the newer games are down to earth in that they don't include aliens at all—*Burgertime*, for one and *Blueprint* and *Hard Hat* and even *Pooyan*. All of them feature everyday items though in not-so-everyday situations.

With the success of *Pac-Man*, programmers have recognized the value of creating an appealing character that a player can identify with. And a game concept must also exhibit substantial potential for interesting strategic maneuvers as well as enough levels of increasing difficulty to sustain a player's interest over a long period of time.

So, the idea gets put on paper but often what sounds good on paper is not necessarily destined to be a hit in the arcades. "It's a gamble," says Gleason, "a Monte Carlo process, and it's so subjective that it's often quite hard to determine beforehand if a game will take off or not." Because of this many intermediate steps are taken, during any of which a game may be discarded.

Not An Ideal World

Once the idea has been suggested and fleshed out in some detail—with the universe of the game and the laws of physics that apply in that world rigidly defined—the hard work begins: designing and building the components. Programmers use computers that are generally worth upwards of $30,000 and offer the utmost in flexibility during the designing process. This is important because of all the changes that will necessarily be made during development.

Programmers work closely with engineering technicians at this stage to determine if the game can be developed using existing hardware or if more advanced hardware must be created to meet the new game's sophisticated demands. In an ideal world, the hardware would be determined by the requirements of the game concept, but this is not an ideal world. Since it takes a lot more time and money to go about it this way, most games are designed around existing hardware. Only in cases that are really exceptional—when a game has been judged to be of outstanding potential—will new hardware be created.

Programmers do not work in a vacuum. They constantly seek input from company employees and, once a working model is put together, they may also conduct focus groups by bringing in players to check out the game. "We like to get as much reaction as possible," says Stern programmer Mike Schwartz. "And from then on it's a constant process of fine-tuning the game, seeking more suggestions,

and working on it some more. We need to know how people feel about the action. Are there enough interesting hazards? Can they understand what they're supposed to do? Is it too hard? Are the controls too complicated? And so forth."

Some elements of a game may develop inadvertently. In Stern's *Rescue*, for example, a player's helicopter must shoot down a fleet of approaching choppers and avoid sallies from the powerboat in the ocean below, while trying to rescue parachutists in the water before the sharks eat them up. "Because of a quirk in the program," recalls Schwartz, "when the parachutists hit the water they made a whirring noise that we liked and decided to keep. And because it sounded like a food processor, the running joke was that *Rescue* was the game that 'slices and dices' the players."

Degree Of Difficulty

The games, of course, go through enormous changes during the course of development. With *Mousetrap*, Exidy found that too many people wandered off because the maze was just too difficult. "They kept trapping themselves in a corner," says designer Bill Cannon. And unlike laboratory mice who persist, the players would "get frustrated and stop playing." Consequently, the maze was altered and made less complicated.

Indeed, determining just how difficult or easy to make a game is one of the designer's major challenges. If it is so simple that a neophyte game player can stand there for an hour on a single quarter, there's no way anyone will make any money on it. On the other hand, if it's too hard—if players feel that there's simply no way to outwit the computer even a little—they'll simply give up and move on the next game. We don't, after all, play video games to make us feel inadequate.

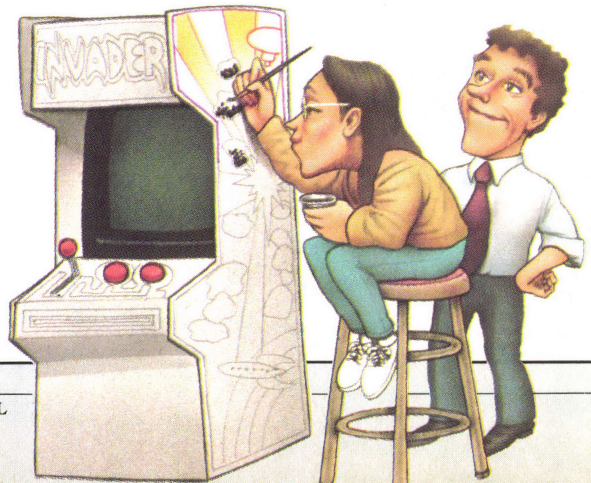
Achieving the delicate balance between too simple and too complex is a tough thing to do and sometimes, no matter how much thought and work goes into this phase of development, it sill fails. Two years ago *Victory*, a space game in which the player had to destroy enemy ships, was a flop for Exidy. Apparently, the programmer had tried to introduce too many new elements at once instead of building gradually on the skills that players had acquired from previous levels and games.

Three-By-Five Game

Victory's game map was five screens long and three screens high and only a fraction of it was visible at any one time. That was a concept that players weren't familiar with and which, consequently, made them uncomfortable. Added to this confusion was the presence of a mini-screen at the bottom showing the entire playing field and indicating where the enemies were, a fuel gauge and controls that were very different from the standard ones gamers had grown used to. Clearly *Victory* was an idea before its time. Nowadays, games like this are the rule not the exception. Complex programs of this nature have even been successfuly translated into the home format—*Star Raiders*, for example, and *Phaser Patrol*.

Oddly enough (or perhaps it isn't

On the third day he ran it on the computer and built a great box. Sturdy he made it, to endure kicks and punches. On the fifth day he painted the box with colors not found in nature.



On the sixth day he tested the game with fanatic youths, who complained loudly with oaths. So in the depths of the great box he fiddled. On the seventh day... voila!

odd at all), a challenging game does not necessarily depend on complicated rules. In *Nibbler* (from Rockola—a game currently in the testing stage) an alien worm wanders around a maze picking up objects in its path. The more it eats, the bigger it grows and, at successive levels of difficulty, the maze gets more complex and the worm slithers faster and faster. But . . . the game has only one rule: The worm must avoid crossing over itself. This in itself requires a lot of practice.

Trying a game out in the arcades is the most crucial test of its potential stardom. After all, the bottom line is how many quarters a player drops into the old slot, right? A new game must be able to hold its own against tried and true champions. It is at this point in the development that designers make a final decision on title. The name of the game is extremely important. "If you called a game something like *Dripping Slime*, it would turn people off immediately," says Gleason. "*Nibbler*, on the other hand, might pique a player's curiousity." We, by the way, don't agree with him. We think *Dripping Slime* is a dandy name for a game. If you called a game something like *100 Ways to Prepare Lamb Chops*, *that* would turn us off.

Another important test is the stress test. A good arcade game will take a lot of abuse and the cabinet must be designed to withstand everything from punches to frustrated kicks.

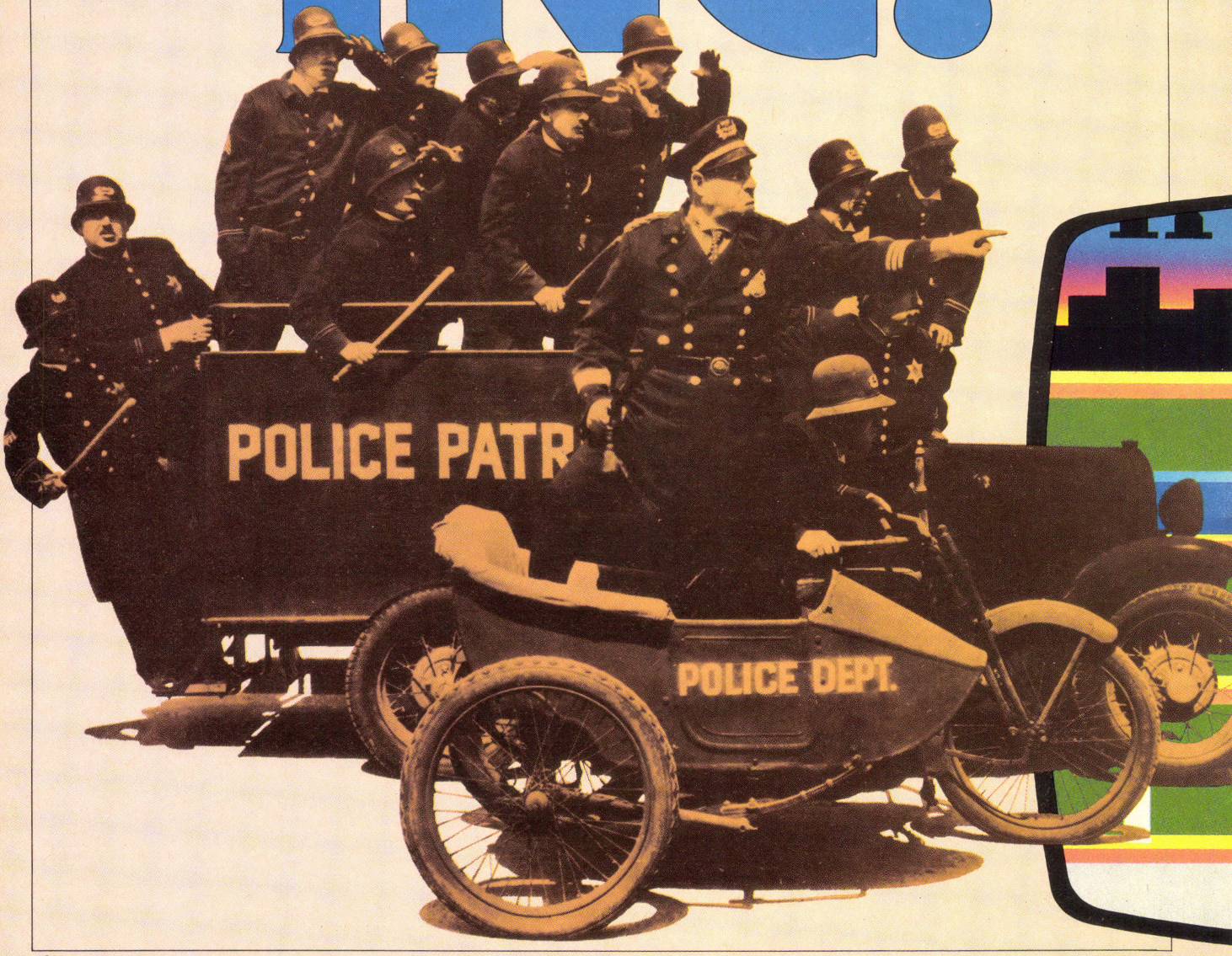
"Play Me"

It is also at this time that the "attract mode" is created. The attract mode is the little playlet that is supposed to entice you by depicting elements of the game while the machine is not actually in use. Characters from the game appear and do cunning little tricks (like turning a "Y" that has been printed upside down right side up again). In short, it's an informal introduction to the game and its characters.

Because profits from video games vary widely from one arcade to the next, the crucial factor is not the exact amount of money a machine pulls in—whether $200 or $500 or even $1,000 a week—but that it generates enough income to rank as one of the top two or three machines in a particular location. And it must hold that position for more than a couple of weeks to prove that it's not just a flash in the Pac. If a game does not sustain intense interest for a period of at least six months, it's extremely difficult for an operator to make much money on it. If the initial try-out proves successful, a manufacturer tests it out on a broader scale, with a dozen or so machines in a variety of locations. As for programmers, it's on to the next round of brainstorming sessions—and the creation of games even more sophisticated than their last endeavor. "I think some of the professors I've had would turn over in their graves if they knew I was using my scientific background to design games," laughs one top-notch programmer. "The point is, I don't feel like just a scientist, and I don't feel like just an artist. In this business you have to be a little more than both of them combined."□

GAMEMAKERS

The Kitchens, I.N.C.



Keystone Kapers' Kreator — Gary Kitchen

One game designer in the family is pretty good. Two is remarkable. But when all three sons in one family become programmers and they all design games for the same company, it's outrageous. Gary Kitchen and his brothers Dan and Steve all work for Activision and Gary's Keystone Kapers *may be the hottest thing since* Pitfall! *Gary also designed the Atari VCS version of* Donkey Kong *by Coleco and* Space Jockey *by U.S. Games. We talked recently with Gary about his games and what it's like to grow up in a family that is a video game phenomenon.*

Interview by Dan Gutman

EF: I understand you designed DONKEY KONG for the VCS.

GK: Yes. I was working under contract with Steve Kitchen—my brother—who runs Woodside Design Associates, a California-based design company. He worked with Coleco in the past and they contacted him to do VCS games. Because he had a lot of work, he contracted me to do *Donkey Kong*.

EF: Is it difficult to translate an arcade game into a home game?

GK: Actually, when they were testing the game in New York arcades, my wife and I went specifically to see it. We thought it was the greatest thing we'd ever seen and I said, "Boy, I'd love to do that on the Atari VCS." A month later Steve called me up. I set out to do good graphics. I said, I've got to make it look just like the arcade game—I mean *exactly* like it. But if you try to put all four screens in, you're going to get something that looks like somebody else's arcade adaptation—all flickery and square and lousy. It's just not worth it.

EF: So you eliminated the elevators and the conveyer belt screen.

GK: Right. I just couldn't fit them in the amount of space I had. I really had to shoehorn it to get the *second* screen in. To get graphic quality and squeeze in three screens would have been impossible.

EF: If you had done all four screens, what would they have looked like?

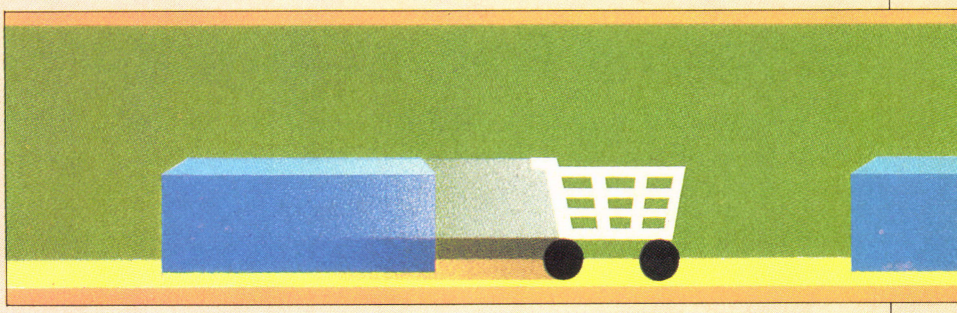
GK: Well, you're talking about resolution. As far as the number of lines of resolution on the TV screen, it's how fast you update the information. All of Activision's games, and *Donkey Kong*, are single line resolution. The information is updated every line on the screen. It makes it less blocky. If I had gone to double or triple line resolution, I would have had ramps that looked like steps.

EF: How did KEYSTONE KAPERS come about?

GK: I was going to do a game with a cop chasing a crook. The Keystone Kop was my wife's idea. The cop chases the crook through a department store. It's a multiscreen game—eight screens—and it has animated escalators and elevators. The idea is to avoid obstacles that the crook is throwing at you and try to catch the crook in the shortest amount of time.

EF: There are some similarities to PITFALL!

GK: Right. You run from screen to screen, and there are treasures in both games. But where *Pitfall!* is



more of an adventure game, this is an action game.

EF: I saw you score 42,000 points yesterday. Can you tell me how?

GK: Sure. If you run at full speed, you'll have no problem at the edge of the screen. If you jump and then stand around, there's going to be a constant wave of shopping carts and you'll probably get clobbered. Always run at full speed. On the ball screen, don't be afraid to run right up to the ball and jump over it at the last second. You can also jump earlier than you do in most games. Keystone Kelly really sails. Don't wait around for the elevator, go to the escalator. Otherwise you lose bonus points. The only time you should ever take the elevator is if you get to the screen and it's just about to come. Then you hop in.

EF: Did you have any difficulties in designing KEYSTONE KAPERS?

GK: ROM space. A game that's just running and jumping is really going to bore the player. Initially what I had was balls bouncing, planes flying, and shopping carts rolling. I put color tables on all the objects, meaning that they are all multicolored—that gives you more realism. When you do all that you're taking up a lot of space, like three quarters of the entire program. Then you've got to sit down and put in the game play in the remaining space. Just like any other thing I've written, I had to really cram it to finish the game. Designing games is a big puzzle.

EF: Were there any things that you wanted to put in KEYSTONE KAPERS but had to leave out?

DK: Oh yeah. I had a great police car in the game at one point, called the Paddy Wagon. I had to take it out because it didn't fit in with the game play at all. Also at one point there was a TV set. I took that out because it didn't make sense—the Keystone Kops were around before there was television. I had a bomb in there too but it wasn't very important to the game so I got rid of it.

EF: It's interesting that you and your two brothers are all video game designers with the same company. Can you tell me how that came about?

GK: My oldest brother, Steve, is the one that really got us all started. He got heavily into electronics and computers when he was 18. He started a company in New Jersey and gave me a job after college. Just out of the blue one day he said, "Let's try doing a game with electronics." So we started making handheld games, some of them for Parker Brothers. We also hired my brother Dan when he was 18. Once we started the handheld games, I said, "That's it—no more digital clocks, no more calculators. Games is what I want to do."

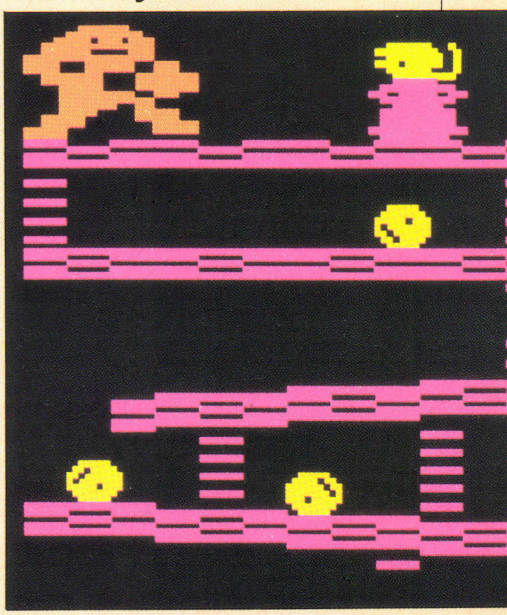
EF: Was DONKEY KONG your first VCS game?

GK: No, before that I did *Space Jockey* for U.S. Games. It was a 2K game, so it didn't have as much variation as it could have. It was double line resolution. But it was the first thing that I did and I learned a lot from it.

EF: So how did the Kitchen boys come to Activision?

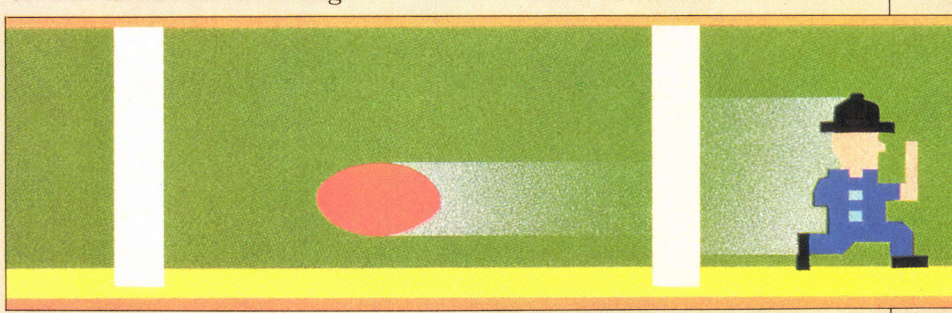
GK: Dan and I started looking around when VCS games really started catching on. Steve came in from the West Coast, and since we always respected Activision, we approached them. That was in 1981.

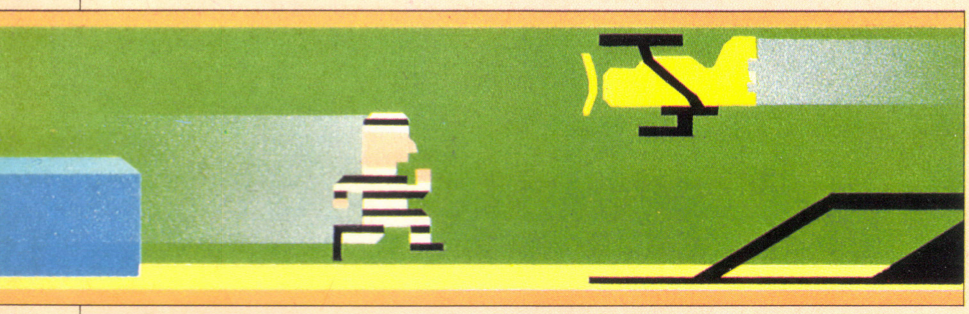
EF: Do the three of you ever collaborate on games?



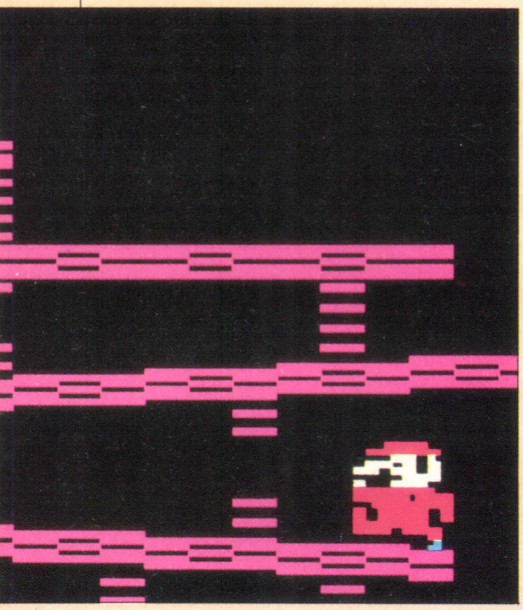
Kitchen's KONG: In the VCS version

GK: No, but Dan and I work very closely on games. *Keystone Kapers* is my game—I wrote most of the code—but Dan had a lot to do with it. I'm helping him with the game he's working on now. It's a cross-fertilization of ideas.





EF: Can you give me an example of this cross-fertilization?
GK: Sure. It's never, "I'll write this section and you write that section." It's an idea collaboration, not a code collaboration. For example, I called up Dan and said, "Look, I want an object you can duck under." He thought about it and suggested an airplane, and I put it in. I do it with the other guys at the Activision Eastern Design Center too. I'll be working on something and I'll say to the other guys, "What do you think of this color? Is it weird?" There's a lot of teamwork.



Gary had trouble with ROM space.

EF: Is there any sibling rivalry in your family?
GK: A little. Dan and I don't see Steve that often because he's in California. So Steve had no idea about *Keystone Kapers* until it was finished. I like to keep him on his toes. He works on things he doesn't tell us about. We like to surprise each other and see what we can do.
EF: When you were growing up, were you all interested in computers?
GK: No, Steve was the big computer freak. I was always into art and in my teens I did more drawing and painting than engineering. So I was about two semesters in college and I said, "This is great, but I'm never going to get a job with this stuff." My father got the three of us into electronics. He builds crystal sets and ham radios as a hobby. So I decided to try engineering and put art to the side. It just happened that the one area that you could combine art and engineering was video games—that's why I love it. You know, there are some companies that make artists do the art and programmers do the programming. I'd never work for somebody like that because I like to do my own art work. That's the fun for me—putting the picture up on the screen, animating the characters, things like that.
EF: What was the first thing you programmed?
GK: At one company I was working for we had eight weeks for a programming project, so we hired an outside person to do it. It turned out this guy didn't know anything; he was trying to hide his lack of programming ability. All of a sudden there was a panic, and there were no programmers. Somebody said, "Do you know how to program?" And I gave it a try.
EF: What would you recommend to a young man or woman who wants to be a game designer?
GK: You can get all the advice you want and read all the books you want, but what you've got to do is stand at the computer like I did from day one, and say, "What can this stupid thing do?" You've got to try little things out and make a million mistakes. But the great part about a home computer is you can do whatever you want and you aren't going to blow anything up. That's basically how I did it. I programmed BASIC and I programmed microprocessors and handheld games. I had never done an eight-bit microprocessor 6502. I was just scared of it. I didn't want to touch the thing. One day I said, "I gotta learn this." I just dove in and it was so easy!
EF: What's the most important thing to learn?
GK: I'll tell you, a lot of it has to do with an engineering background. That's the key, as far as I'm concerned. People who have an engineering background and want to learn assembly language have a head start on computer science majors or anybody else. Not that they can't be good programmers, too, but there's a big advantage in

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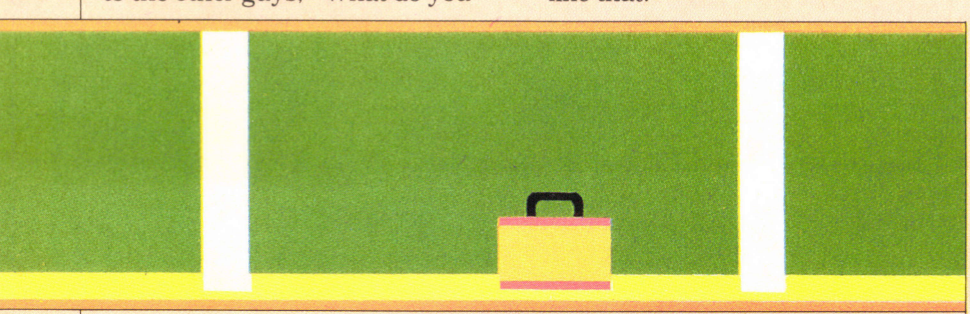
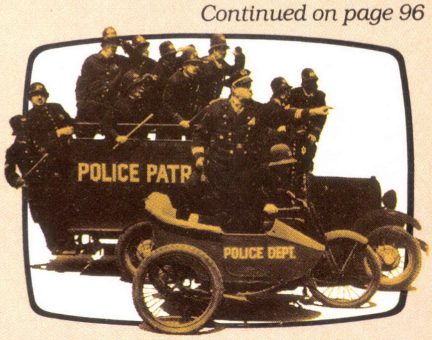
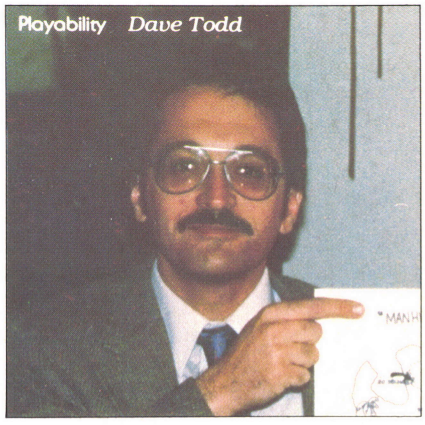




ULTIMATE video game

Graphics *Dan Merrill*


Playability *Dave Todd*

Most Original *Mike Hughes*

Meet the winners of our contest

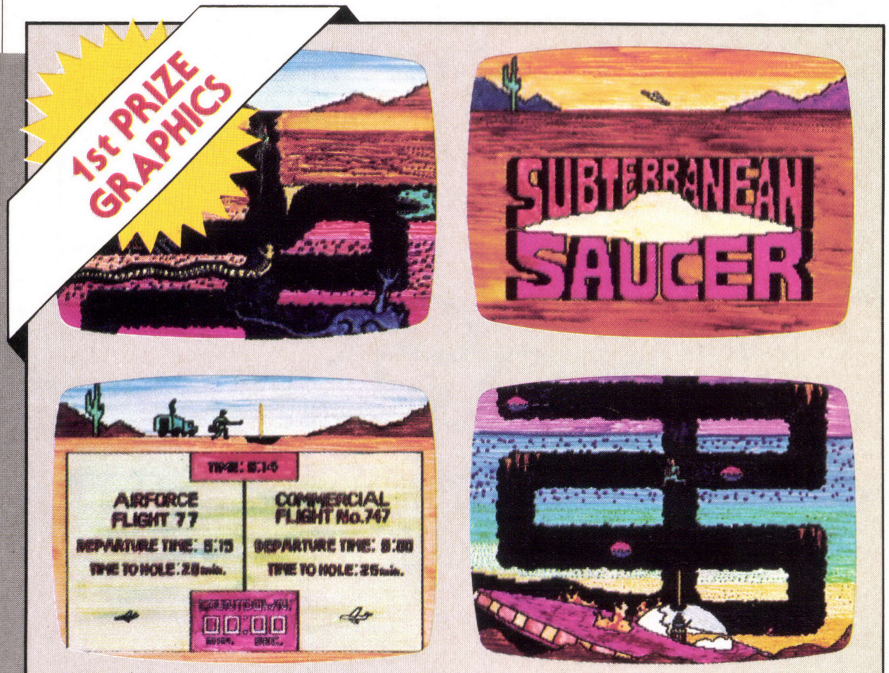
When we asked our readers to design the Ultimate Video Game, we had no idea that so many people would know what the Ultimate Video Game was. We also had no idea there could be so many Ultimate Video Games. We figured one or, at most, two games would qualify for Ultimate ranking. As it is, we received more than 80 (count 'em) entries, each one imaginative, exciting, well-drawn and incredibly complex.

We've chosen six winners and several honorable mentions. First and second place prizes were awarded in each of three categories: Best Graphics, Most Playable and Most Original.

The entries of all the first prize winners will be sent to one of the major video game software companies for evaluation. We can't promise they'll be bought, but they'll certainly be looked at by the company. In addition, all first and second prize winners will receive a year's subscription to *Electronic Fun*.

First Place in the Best Graphics category went to Dan Merrill of Bowie, MD for his game *Subterranean Saucer*. The plot of the game involves a "saucer of unknown origin" which crashes into the California desert. The "terrific heat of the huge craft literally melts the ground as it buries itself deep within the earth. The aliens are dead but a device on board is switched on from the impact." The Army sends a special team of men to investigate and one of them volunteers to go down this mysterious hole which, it seems, emits deadly energy every five seconds. His mission is to go down into the hole and, armed with only a rope and flashlight, descend through several levels filled with dangerous predators, locate the source of the beam and shut it off. This all has to

Frank Cerulli



Journey to the center of the earth: In Dan Merrill's game SUBTERRANEAN SAUCER, (shown here out of sequence) you've got to guide your player through underground caverns filled with danger in order to locate and shut off the source of a deadly beam of radiation.

be done before two planes—one an Air Force jet and the other a passenger plane—pass overhead and lose their crew to the radiation. Congratulations, Dan.

Escape From Hanoi

Second place in the Graphics category went to Tim Miller of Albuquerque, NM for his game *Escape From Hanoi Hilton*. Set in Vietnam, the game object is to free American POWs from the Hanoi Hilton prisoner of war camp. Along the way, you encounter angry protesters, the Viet Cong, boobie traps, land mines, punji stakes, possible sprays of Agent Orange and, worst of all, Charlie, the head of the camp. You have to swing on ropes, climb ladders and shoot the enemy. Occasionally, orange malaria pills show up. They are worth 100 points each. Tim added the following disclaimer to his game. "This game is not designed to promote war, violence or killing. It is an adventure shoot-'em-up-hero-type game."

Top honors in the Most Playable category went to Dave Todd of Fresno, CA for his game *Manhunt*. The hunter in *Manhunt* is named Kruger. In Dave's words: "Stripped of weapons, with a thirty second start, *you* are his prey. You must evade his gun, his men, his dogs on an island from which there is no escape.

"Dogs track your video scent. Cross the swamp, double back, avoid the quicksand. Flight is your only hope. Thirty seconds of freedom earn you a bowstring. The dogs are confused but Kruger's men have you surrounded—there is no escape.

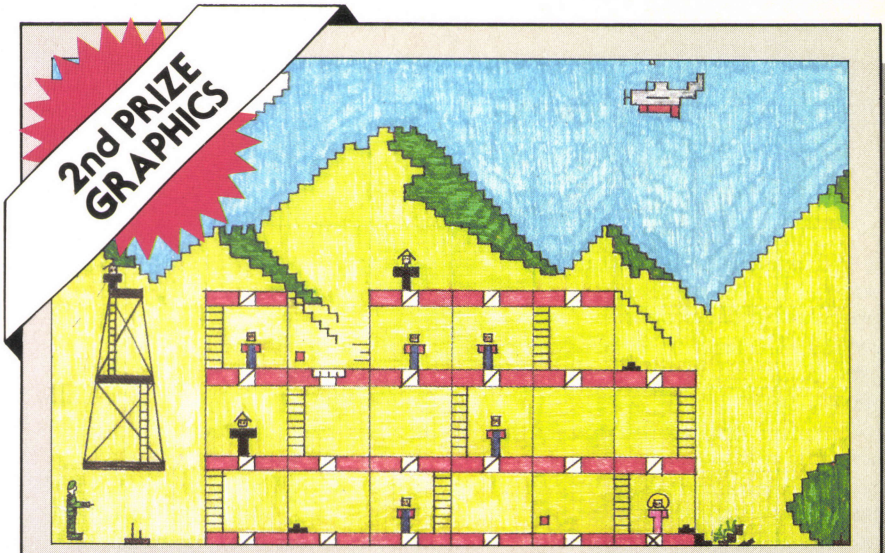
"Find the trail that takes you away from the poisoned darts of Kruger's men. The dogs have your scent now. The ravine is your only chance. The bridge is falling, but, with only fifty seconds elapsed, you make it across before it collapses and you earn a bow. All trails lead to Kruger's domain. His men have crossed—there is no escape.

"Blood Of The Kill"

"The blood of the kill is Kruger's sport. Ten bullets seek you but now you find the arrow. Kruger aims as you pull back your bow. From the sneer on his face you feel there is no escape but you know what to do . . ."

This one gave us goosebumps.

Second place in Most Playable was awarded to Chris Lesnick of Sedona, AZ for his game *Scorpio*. The object of his game is to protect a 3-D grid from cosmic scorpions and termites. A monitor keeps you apprised of the presence and coordinates of the termites. Space scorpions, which can destroy you,



Viet Kong: Tim Miller's game ESCAPE FROM HANOI HILTON makes you the savior of American POWs in Vietnam.

also lurk in the structure. A second monitor alerts you to which level, width or depth the scorpions are on but it only tells you one of these. You've got to figure out the other coordinates yourself. Different passages are blocked at random for random periods of time. You must align yourself precisely with any one passage in order to see all the way down it.

Supreme Video Game

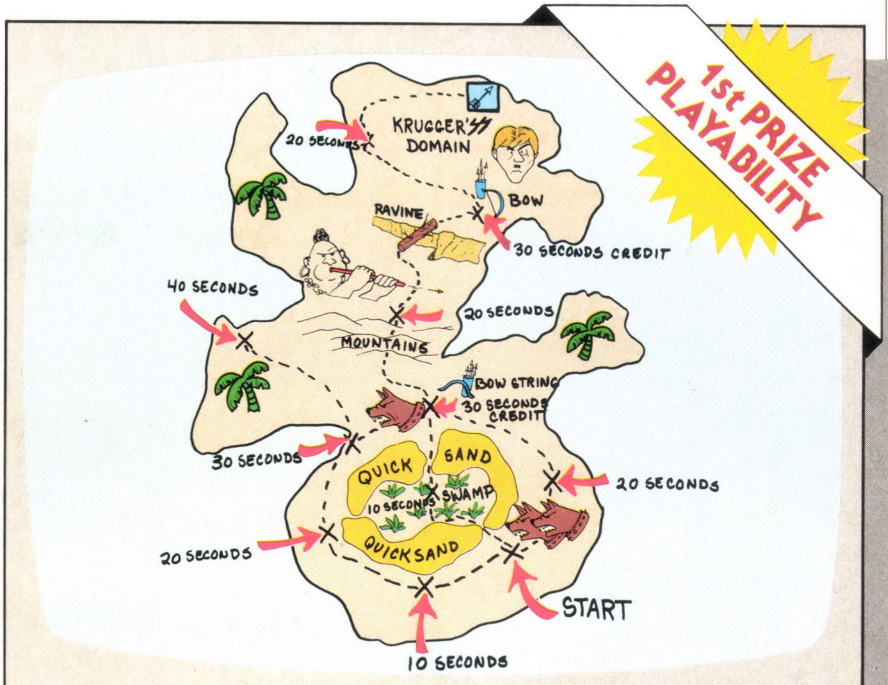
Winner in the most Original Game category was Mike Hughes of Gretna, LA for his game *Omega Ultimatum*. Says Hughes: "The supreme video game has to surround the player. A comfortable chair has to be supplied with, of course, a well-padded edge because at the end of the game it will be the only thing supporting the player." His game has a spaceship battle theme where the player has a cockpit view and the controls are handlebars with bar grips which are the firing buttons. One foot pedal activates hyperspace and another foot pedal launches the ship into a limited time recreation-recharge area. There are four screens—top, front, left and right. Enemy ships can approach from any one of them. The chair swivels to face any screen and tilts back to view the top screen. Occasionally, a sister ship or a friendly student transport ship passes through your sector. If you mistakenly destroy one of them, you risk bringing the wrath of the Federation upon your head."

There was a tie for second place in the Most Original category. In alphabetical order, the second place winners were Todd Ackerson of Merrimack, NH for his game about whales (which came with no title, so we're referring to it as *Jonah's Revenge*) and Ronald Arboleda of Gretna, LA for his game *Revelation*.

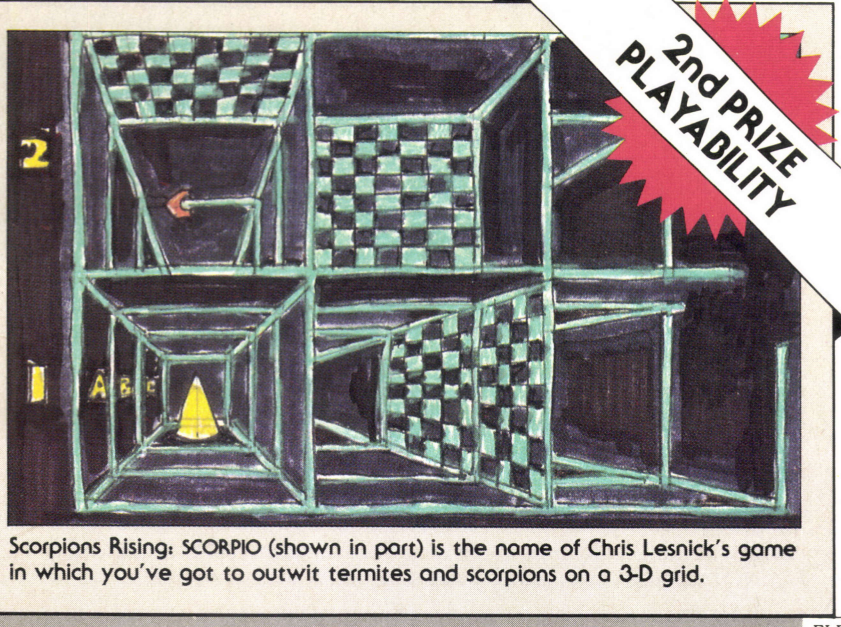
In *Jonah's Revenge*, it's the year 2090 according to Todd and "thanks to the efforts of environmentalist groups like Greenpeace, the seas are so safe for whales that there's been a population explosion." Your mission is to captain a Hunter-class warship and destroy as many renegade whales as you can before they destroy you.

Good Vs. Evil

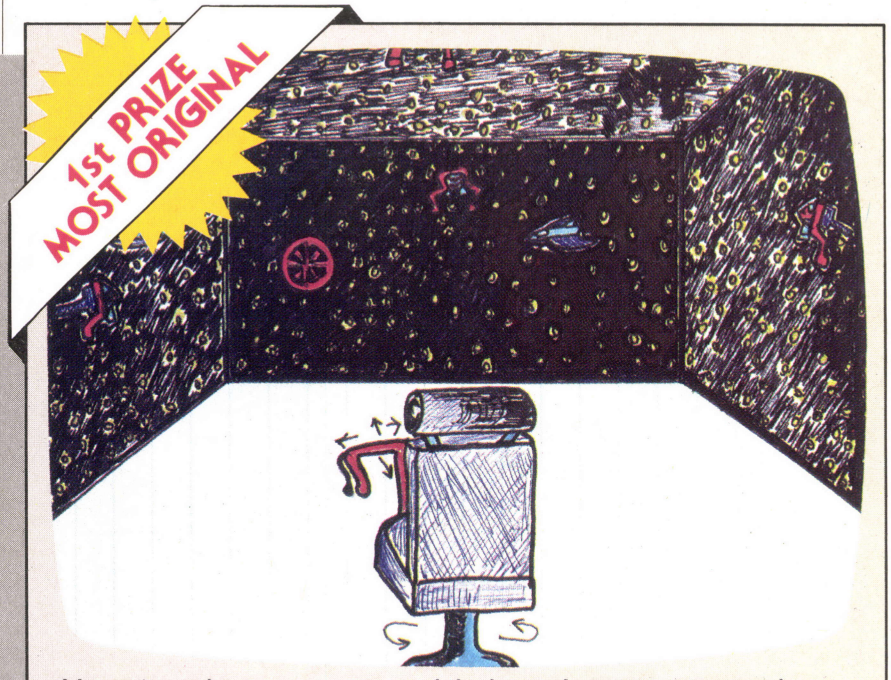
Revelation recreates the classic battle between good and evil . . . "The Antichrist has risen and is living on earth. An angel from heaven descends to earth to give you the mission to destroy him. In order to do so, you must collect the seven daggers of Gabriel which are in a museum in Egypt." You are given a few mystical gifts



The Manly Sport: MANHUNT, the winning submission from Dave Todd, is a chase game. you've got no weapons and only a thirty second headstart and you've got to outwit the evil Kruger and his bloodthirsty hunters who are after big game...you!



Scorpions Rising: SCORPIO (shown in part) is the name of Chris Lesnick's game in which you've got to outwit termites and scorpions on a 3-D grid.



It's so nice to have a game surround the house: In OMEGA ULTIMATUM by Mike Hughes the screen surrounds you and you are provided with a comfortable chair which swivels and tilts. The controls are located in handlebars and foot pedals.

by the angel but can only use them once, and the Antichrist has to be destroyed before he reaches the peak of his power or he will have conquered the world. An added dimension put in by Ronald was music; "While the game is going on, mad singing (similar to the music of *The Omen*) is heard in the background."

There were so many good games that we have a very expansive Honorable Mention category. Those so honored are:

Kiernan Holland of Los Alamos, NM for *Trans-City 2000*, the "Ultimate Urban Warfare Game."; Chad Lancaster of Live Oak, FL for *Roach* in which you are a roach in a room with a lot of people wearing pointed cowboy boots; Michael Lininger of Gahanna, OH for *Phantom Warrior*, a futuristic war game; Chris Papcin of Oxford, CT for *Junkyard*, a 3-D shoot-'em-up game set in a junkyard teeming with living junk and Ronald Rampolla of Flushing, NY for *Racers*, a game that pits racers against one another starting with turtles and progressing to space ships.

We want to thank everyone who entered for helping to make the contest such a big success. And, if you didn't win this time, look for future contests.

MORE STANDOUTS

There were so many good games that, as we said, we were hard put to decide on winners. Here are some of the other games that stood out:

Woody Woodpecker from Nancy Rich—a game involving trees and Woody. Nancy did a fantastic job of illustrating the screens using a collage technique. So did her brother David who represented all eight screens of his game *Asteroid Storm*.

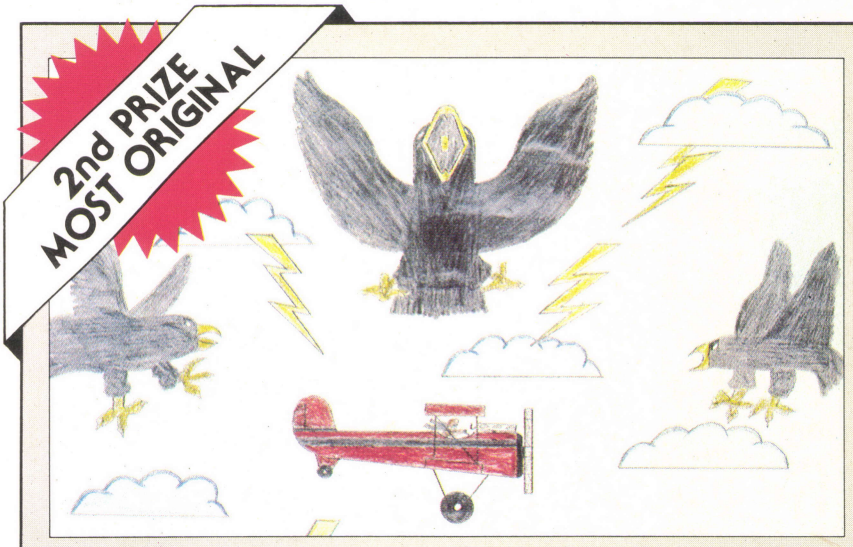
Then there was William Smaling's patriotic game which had no name (that we could discover) but which involved jelly beans, inflation and Ronald Reagan.

Also good were the names that people gave their enemy forces: Borvons, Corghiens, Binolians, dodecahedrons and so forth.

Drawing on a classical theme was Cheryl Ackerson whose game had no title but involved Jason and the Argonauts.

We also liked *Paperboy*, a game of coordination and current events. In Nick Vigorito's game, you're a paperboy who has to deliver newspapers to all the houses on your route avoiding potholes, parked cars, garbage cans etc.

And then . . . and then . . . and . . . we wish we could have given everyone a prize. We loved them all.□

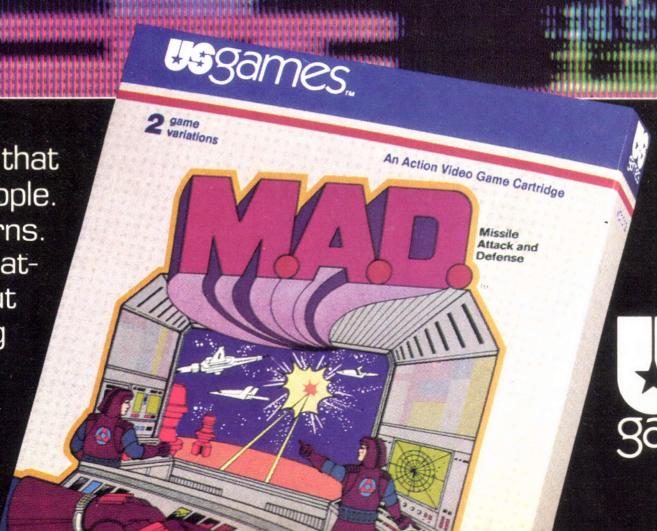


There were two second prize winners: Todd Ackerson (JONAH'S REVENGE) and Ronald Arboleda, whose game REVELATION is pictured above.

GO ONE-ON-ONE.
MAN-TO-MAN.
NON-STOP.
TRIGGER MISSILES.
FIRE CANNON.
ATTACK.
ESCAPE. EXPLODE.
DEFEND. DESTROY.
GO
M.A.D.

©1983 U.S. Games Corporation
A Subsidiary of The Quaker Oats Company

M.A.D. is the combat game that works like real combat: Two people. Head-to-head. At the same time. No waiting turns. Your evil opponent launches attack missiles. You blast them out of the sky, then try your hand at being bad guy while he defends. It's constant action, no playing benchwarmer. One and two-player programs, it's M.A.D.



US games

Parlez-vous BASIC?

By Randi Hacker

Expanding your BASIC Vocabulary Part II

If BASIC *be the spice of life, type on. Or words to that effect. Anyway, last time we learned how to do some simple commands in* BASIC. *This month, we're going a step further. While the commands will still be simple, they'll help you continue to build a foundation on which to construct more complex programs later on.*

Mastering a language is a tricky undertaking at best. There are all those ground rules to learn—grammar and syntax, to name just two—before you can even hope to become comfortable or speak it as if it were second nature. BASIC is no different, really. The ground rules and "grammar", terms and punctuation are as important and rigidly structured as in any language, except that it's not spoken. As we said last time, one of the things you *don't* have to worry about is pronunciation.

In this installment we'll cover terms like GOTO, GOSUB, REM, IF . . . THEN and READ and DATA. These are comparable to learning to say things like "Where's the bathroom?" or "How much does it cost?" in, say, Italian. You learn to make yourself understood before you can carry on a lengthy conversation on the Hegelian Dialectics. Later, you'll be typing like a native.

READ and DATA are simply another means of assigning values to variables. In the first lesson, we used LET (LET A=5, LET B=10, etc.). READ and DATA do essentially the same thing only they give you a little more flexibility. Try this:

```
10 READ A,B,C
20 PRINT A,B,C
30 DATA 5, 10, 15
```

Now hit RUN (Remember RUN?) The computer printed 5, 10, 15, right?

A breakdown of the program might help. The first line tells the computer the names of the variables—in this case A,B,C—and further tells it to assign it values in that order. The second line tells the computer which order to print the variables in and the third line contains the values themselves. An important thing to remember is that the computer takes everything literally. It will assign values to variables in an orderly sequence. A, B, C; 5, 10, 15. It won't arbitrarily assign A the value 10. It's not that kind of computer.

If you assign more values than variables, the computer will automatically stop when the number of variables has been exhausted. If you assign too few variables (A, B, C; 5, 10) the computer will tell you you've erred.

Another thing to be aware of is that even if several READ

statements are used in the same program, they will take their values in sequence from the same DATA statement. When all the DATA in one statement are used up—that is, when all values have been assigned once—the computer moves on to the next DATA statement. Even if the READ statements are scattered throughout the program, the computer will search in line number order and take the DATA statement with the smallest line number first.

```
10 READ A
20 PRINT A
30 READ B
40 PRINT B
50 READ C
60 PRINT C
70 READ D
80 PRINT D
90 READ A
100 PRINT A
110 DATA 400, 2001, 16
```

Michael Okamoto

```
120 DATA 245, 100
RUN
```

What happened? What value did A end up with? (ANSWER: 100)

One of the real beauties of READ, DATA is that you can make the computer print the variables in any order you want simply by altering the PRINT statement. Let's try a program in which the variables are string variables. (Remember string variables? A$, B$, C$? These are for variables that aren't necessarily numbers. A can't be a word but in some BASICs [not Atari] A$ can be either a word or a number. String variables are often preceded by a DIM [Dimension] statement which tells the computer how many letters will be in that variable, e.g. DIM A$ [10].) Try this:

```
5 DIM A$ (10), B$(10),
C$(10)
10 READ A$, B$, C$
20 PRINT B$, C$, A$
30 DATA YOU, I, LOVE
RUN
```

The PRINT statement informs the computer of the order in which you want the variables to appear but the values taken from the DATA statement will be taken in the order in which they're typed in. If READ is A$, B$, C$, then DATA must follow that way; A$ = you, B$ = love and C$ = I. See? Change the order of the variables in the PRINT statement and see what happens. By the way, numbers and words can be used in the same READ, DATA programs.

Notice that you don't need any quotation marks in the DATA statements. This is different than in PRINT statements where quotation marks *must* be used. Also, if you use semi-colons instead of commas, the words will print closer together.

REM

REM is not strictly a command. It's more of a note to yourself or, if you prefer, a way of giving your program an identity. It doesn't affect the program in any way.

```
10 REM This is a program at-
tempt by Randi Hacker
20 PRINT "HELP! OH,
HELP!"
RUN
```

Now, let's assume this is not a graphic enough illustration of the despair you feel over ever learning to program in BASIC. You want this program to be a strong statement indicating the help you need. You want it to repeat your anguish. How? By using the GOTO command to create an endless loop.

The Endless Loop—GOTO

GOTO is a very useful phrase that will effectively turn your computer into a gibbering idiot. No. GOTO puts your computer into what's known as an endless loop. Try this:

```
10 REM This is a plea
20 PRINT HELP! OH, HELP!
30 GOTO 20
RUN
```

What happened? The computer started printing HELP! OH, HELP over and over and over endlessly, until you probably felt like slapping it. Why? Let's dissect the program to find out.

Line 10 is a throwaway so let's move right on to line 20. This one tells the computer to print HELP! OH, HELP! Line 30 tells the computer to go back to line 20 and print HELP! OH, HELP! again after which it goes on to line 30 which sends it back to 20 and so on. (To stop it, press BREAK.)

In this particular program, the message goes by awfully fast. Too fast. And at this speed, it's of no use to us at all. We want it to repeat slower. How? By introducing a time-delay loop, that's how. Insert this line:

```
25 FOR T = 1 TO 200:
NEXT T
```

and RUN. See? It went slower. Why? Because . . .

Line 25 tells the computer to count from one to 200 before going on to the next step. The higher the number assigned to T (or you can use any letter you want here), the longer the computer counts and the slower the program repeats itself. The smaller the number, the faster the program repeats.

IF . . . THEN

IF . . . THEN statements expand your programming abilities even further. They instruct the computer to react in a more human way—to respond one way to one answer and another way to a different answer. In Atari BASIC (which is the one I'm using), IF . . . THEN can only be used with numbers. So, if in your program, you want the computer to respond to, say, a YES or a NO answer, you've got to substitute numbers for words. For example:

```
10 PRINT "ARE YOU MAR-
RIED? PRINT 1 FOR YES
AND 2 FOR NO."
20 INPUT A
30 IF A = 2 THEN 60
40 PRINT "GOOD FOR YOU.
YOUR MOTHER MUST BE
VERY PROUD."
50 GOTO 70
60 PRINT "WHAT? YOU'RE
NOT MARRIED? AND AT
YOUR ADVANCED AGE?
SHAME ON YOU!"
70 END
RUN
```

Line 50 is there to stop the computer from printing line 60 if the answer was yes.

Some BASICs

are more sophisticated and will accept **IF . . . THEN** statements using words. Consult your **BASIC** manual and see if yours is one of those.

GOSUB

As your programs get more and more complex, you'll want to find shortcuts to help you cut down on the number of times you've got to type a particular command. Subroutines can help. A subroutine is a command or set of commands (a short program in itself, actually) that is used repeatedly throughout the program. Using subroutines allows you to check small portions of your program as you go along and cut down on the number of errors by cutting down your need to type so much.

That's where **GOSUB** comes in. You type in your program and each time you come to a place in the program where you want, say, a time-delay loop or sound inserted, you type **GOSUB** and then a line number. For example, 1000. This tells the computer that it should skip ahead to line 1000 for further instructions. At the end of all **GOSUB** routines, you must type **RETURN** to inform the computer that it has to go back now and start from the very next line number, following the one where it left off.

```
10 PRINT "HELLO"
20 GOSUB 1000
30 PRINT "GOODBYE"
40 GOSUB 1000
50 PRINT "THAT'S ALL
FOLKS!"
60 END
1000 FOR T=1 TO 800:
NEXT T
1010 RETURN
RUN
```

Without **GOSUB**, the program would look like this:

```
10 PRINT "HELLO"
20 PRINT "GOODBYE"
30 PRINT "THAT'S ALL
FOLKS!"
RUN
```

And, without **GOSUB**, the words would print out at an alarmingly fast rate. The **GOSUB** subroutine, in this case, serves to slow

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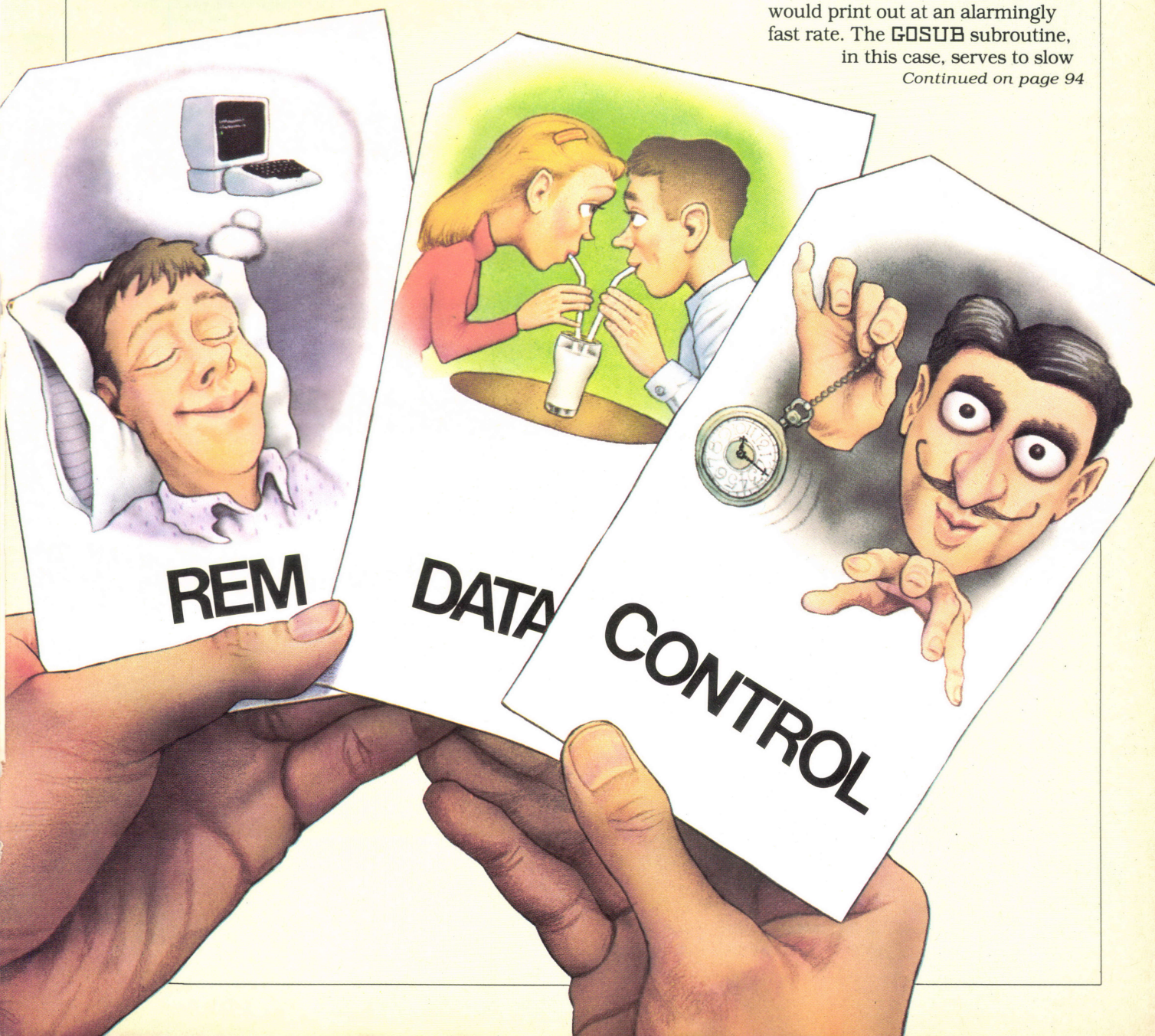

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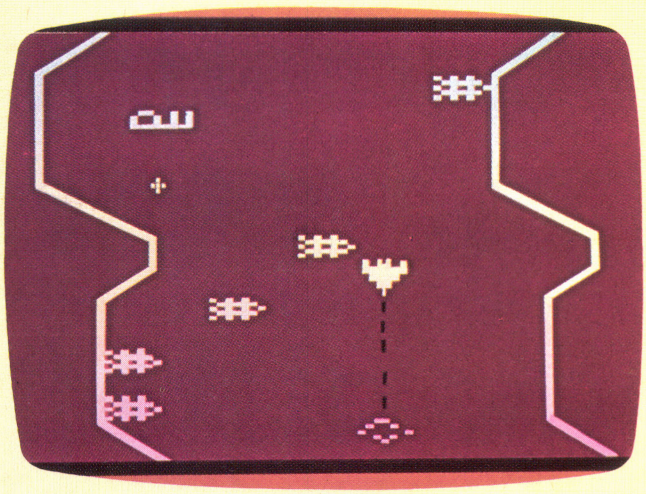


FANTASTIC VOYAGE ///

Fox Video Games/Atari VCS

By Mark Trost

You've mastered outer space, but how about inner space? *Fantastic Voyage*, based on the 1966 science fiction movie actually offers a great premise for a video game.

As in the film, you're in a tiny ship travelling trough a critically ill patient's bloodstream in a race against time. Your mission: to destroy a malignant blood clot. You must move through narrowing arteries, destroy life-stealing bacteria and avoid life-preserving blood cells as you attempt to reach the clot before your patient expires. Sounds great, eh? Well, that's just it, it sounds great, but . . .

It's not only that Raquel Welch isn't along for the ride or that you never really win (just earn the right to operate again), it's that the game doesn't ever realize its potential. Instead of offering mulitple challenges forcing you to keep one eye on the time clock and another on the death-dealing blood stream, the cartridge (when played to save patients) becomes little more than a race game in which you end up avoiding rather than defeating all the challenges thrown at you.

There's a lot going on here. The game screen is aglow with eye-grabbing images including your ships, the artery with obstacles of all shapes and sizes, a time clock, heart monitor, point score readout and patients saved display. Unfortunately, nothing addresses what I feel should be the key element of the game—how much time you have to save the patient. The time clock spins, but never offers a precise measurement of how much time remains. Only the patient's quickening heart rate tells you time is short, and that's inexact at best. Further, every time your ship is hit by a floating piece of patient innards, your time is diminished—by how much is anyone's guess. And how many times your ship can be hit by cells and clots before the patient expires is a big mystery also.

Points are awarded for shooting such enemies as enzymes, defense cells and blood cells. This is interesting because the instruction manual tells you to avoid them at all costs but the game rewards you with points—go figure.

If only the designer incorporated a digital clock a la *Pitfall!* instead of a meaningless analog-type and awarded more time for bacteria destroyed while detracting time for ships and blood cells damaged, the game would be far more enjoyable. In the movie, the Fantastic Voyagers knew to the second how much time they had to do their jobs. We only wish we did.

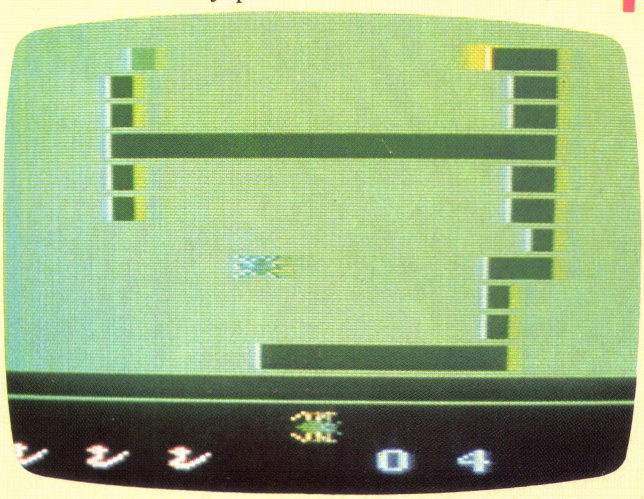
Stay to the right and pass blood cells to the left. Virtually all debris comes from the left and moves to the right.

TAPEWORM //

Spectravision/Atari VCS

By Kim Mills

If you want to succeed at *Tapeworm*, forget high school biology. Tapeworms are no longer those horrid, nasty parasites that hook into the



Multiple Choice

intestinal tracts of mammals, devouring partially digested food. The tapeworms, according to the folks over at Spectravision, are very cute little "criters" (their spelling) that (1) live in bean patches, (2) love to eat fruit and (3) are preyed upon by other "criters" named Beeky the Bird, Spanky the Spider and everyone's favorite, Mystery Beetle.

As the game of *Tapeworm* opens, our hero Slinky is patrolling the local bean patch. In order for Slinky to get the fruit he loves, he has to slither around the screen eating up all the beans.

Using a joystick, you make Slinky pursue the beans, which remain stationary until he touches them with his head (merely a yellow square). Then another appears somewhere else on the screen, and you're off again. The more beans Slinky eats, the longer he grows—which is a problem. As you steer Slinky through the bean patch, you must take great care not to coil him back over himself because, omnivore that he is, Slinky will eat himself.

But don't use too much caution because while Slinky is hot after those beans, a beetle is moving across the bottom of the screen, outside the bean patch, bearing down on something you're supposed to believe is an apple (at higher levels, the apple becomes an orange, grape, strawberry or banana). While the "fruits" are at least fruit-colored, it takes a strong imagination to believe the block graphics resemble anything you'd find at a greengrocer's. Anyway, if the beetle gets to the fruit before Slinky eats his bean, two more beans appear on the screen and Slinky has to eat them, too.

There are other hazards to Slinky's health. The predators—Mystery Beetle, Beeky and Spanky—bleep across the bean patch at random intervals. If they happen to touch Slinky's head, it's curtains for the worm.

But that doesn't mean you can get complacent. if Slinky touches the edge of the bean patch, he also meets the Grim Reaper. But, be aware that Slinky doesn't always respond precisely to the directions you think you're giving him with your joystick. It's better to be safe than a dead worm.

Don't approach the beans head-on if they're close to the edge of the patch. Try to get Slinky parallel to the perimeter of the patch so he can eat the bean sideways.

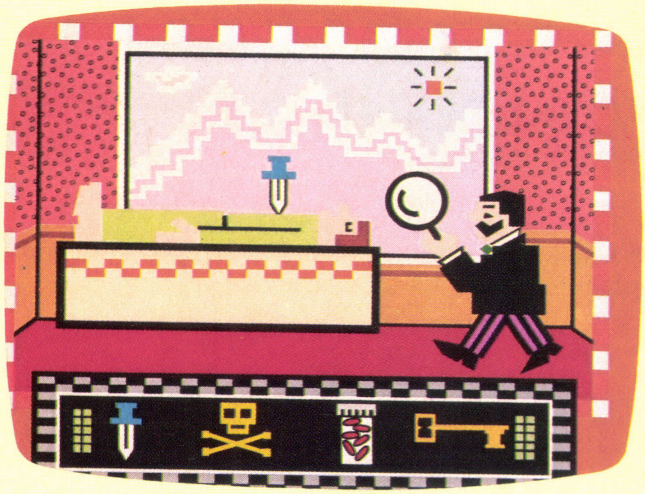
ORIENT EXPRESS ♪♪♪♪

Imagin/Atari VCS

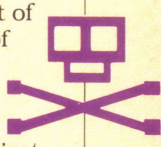
By Randi Hacker

No, this is not a game about a Chinese take-out joint. The title refers to that famous and elegant old train, the Orient Express. It may have stopped running a few years ago but it's running again on your TV.

In this game you are detective Hercule Poirot. You



and eleven other passengers are riding from Paris to Istanbul when a grizzly murder occurs. The object of the game is to pick up clues in the compartment of each passenger and put them together to come up with the murderer's identity.



The game begins in the club car with all of the suspects seated. A touch of the fire button puts Poirot into the murder victim's compartment where he begins to gather clues—among them a monogrammed handkerchief, poison, a dagger and ripe Brie. These are all located at the bottom of the screen and are retrieved by positioning your cursor over the one you want and

pressing the fire button. If you have picked up and left behind the correct combination, you are given a key which lets you enter the next compartment—where you first have to fend off enemies and then assemble a new set of clues to gain entrance into the next compartment. Although you may leave your shoes outside the compartment for the porter to shine, don't make the all too common mistake of leaving your *clues* out there or the porter will pick them up, won't shine them *and* won't return them—not even when bribed.

At the end, when you think you know whodunit, a push of the fire button will return you to the club car where, using your joystick, you manipulate Poirot so that he touches the suspect you've chosen as the perpetrator of the crime. If your guess is incorrect, you're returned to the murderer's compartment and stripped of your epaulets. If your guess is correct the French national anthem plays.

The graphics are luscious—the snowcapped Alps can be seen scrolling by through the train windows and the Victorian compartments are complete right down to the red velvet curtains and heavy mahogany highboys. Poirot is a masterpiece of computer animation with his handlebar moustaches and hearty appetite.

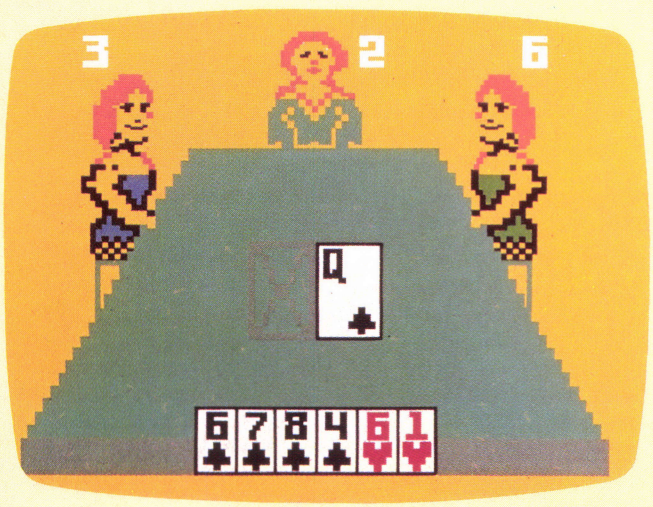
When you reach the dining car, stay away from the filet of sole. It isn't fresh.

ROYAL DEALER ♪♪♪

Mattel/Intellivision

By Mark Brownstein

If you don't feel like armchair athletics or a game of intergalactic shoot 'em up, you can always play a good game of cards. At least, this is what Mattel must have been thinking when they developed *Royal Dealer* for Intellivision.



Royal Dealer offers you three game choices (with a fourth very similar alternative); Crazy Eights, Rummy (with 1-3 opponents), Gin Rummy (with only 1 opponent and 10 cards initially dealt), and Hearts. In all games except Gin Rummy, you can select at the beginning of the game how many opponents you wish to play, from 1 to 3. This time, you get to challenge three ladies. Playing them is like playing against the sphinx: no matter what cards they hold, they never even *hint* at what's in their hands. In order to beat them you have to resort to a strategy of trying to remember which cards have already been discarded.

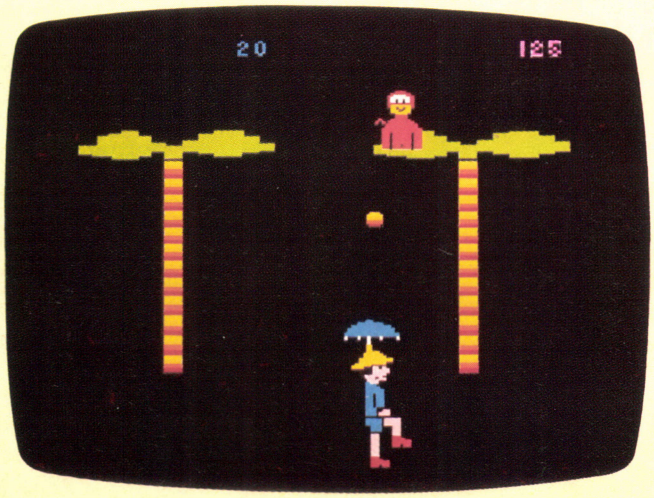
The cartridge is, on the whole, well designed and executed. At the beginning of each hand you hear a realistic-sounding shuffle of the cards. When a card is dealt, it *sounds* like the card is being dealt. The scores are color keyed to match the dresses of the ladies, so there is no question of who scored what. During play, you can see how many cards your opponent(s) is (are) holding, but there is no mirror behind her to see which cards. This makes cheating *very* difficult. When all the cards have been used, there is a reshuffle. The game is over when one player scores 100 points.

It seemed as if there really were a total of 52 randomly generated cards (a shortcut would be to deal from a smaller deck; who could know the difference?). Of all the games, the one I like best was *Crazy Eights*. It was easy to learn, easy to master, and didn't let you get too far ahead of the ladies strategically. Next on the list was *Rummy* (and its close variant *Gin Rummy*), which also played quite well. I suspect, however, that there may not have been quite enough RAM on the cartridge to allow your opponents anything but the crudest forms of strategy. This seemed to make them relatively easy to beat. Unlike conventional rummy, you are unable to pick up all the cards in order to pair off discards.

The instructions provided by Mattel for *Rummy* and *Crazy Eights* were clear and unambiguous. *Hearts* was another matter entirely. Not knowing the game before I got this cartridge, I don't feel that I really knew it too well afterward. Although I was beeped at for attempting an illegal move, not much more was offered in the way of assistance.

This game is a welcome change of pace from most of the other video games available, and it *is* kind of fun.

You can determine how long you will be be playing by selecting the number of opponents. it seems the fewer opponents you are playing, the quicker your game goes.



COCONUTS ♪♪

Telesys/Atari VCS

By Sherry Jacobs

Remember the Congo? Well, it wasn't very interesting in history class and it's even less interesting in this game by Telesys. As Stanley I. Presume, you are a man who explores the jungle equipped with nothing more than an umbrella and pith helmet. This, of course, is foolish planning. Who, I ask you, carries only an umbrella in the jungle. It may be a useful weapon on a crowded bus but is of no use in the wild.

During the course of *Coconuts*, Stanley must dodge coconuts thrown by a monkey named Coco who moves gracelessly between two trees (the only two trees in this jungle, I might add). Stanley's only protection is his silly umbrella and pith helmet. If Stanley is hit by a coconut he first loses his umbrella, then his helmet, and the next time he's hit, he's out. The higher your score gets, the more active becomes the demented Coco. There is essentially nothing whatever to this game. With relatively little skill, you can earn 500 points and regain whatever accessory was lost last.

There are brief intermissions when Coco stops (to await the delivery of more coconuts?) and Stanley takes five. Why this rest is necessary at all is beyond me. The game moves at such a slow pace to begin with, the greatest challenge is to stay awake. Poor Stanley might use the time to move to a more interesting jungle.

Despite the well-designed, brightly colored graphics, the game is not salvageable. The sound effects—like this jungle—are monotonous and add little vitality to the seriously deficient game. It is a one player game but if you want to bore more than just yourself, you can play with a friend.

My advice is to stand still and get the whole thing over with as fast as possible.

If you're serious about playing, move Stanley minimally either left or right. There's plenty of time to spot the falling coconuts and get out of the way.

DRAGONFIRE ♪♪♪♪

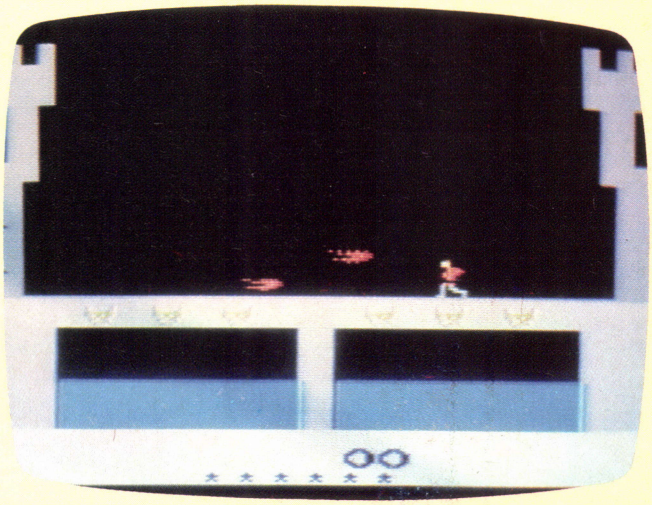
Imagic/Atari

By Marc Berman

Once upon a time in Videoland there was a good king whose castle was taken over by evil, firebreathing dragons. The brave, young prince decided to save the kingdom by retrieving the riches from the palace; with these treasures the king could raise an army and reclaim his castle. Such is the premise of *Dragonfire*.

In this fast moving game, you are the prince. Your first task is to cross the bridge to get into the castle without getting hit by fireballs. Once across the bridge, you appear in a room full of goblets, chests, jugs, lamps, helmets, candelabras, crowns, harps and diamonds of various point values. A ferocious dragon patrols the room as well, spitting fireballs at you when you venture forth from your hiding place. You must clear the room of the treasures and escape out of the magically appearing exit before the dragon singes you seven times.

If you escape with some of your seven chances left, you must cross the next bridge and capture more



valuable treasure from an even faster and meaner dragon.

The graphics are very colorful and funny. The wandering prince crouches, jumps and runs around the castle and the dragons are a triumph of video game art as they rear their hideous heads to spit fire.

There are four levels of difficulty and each can be set for one or two players. On level one, the dragon is green and cranky. The blue, red, and orange dragons are increasingly angry, smart and fast, shooting barrages of fireballs at the agile heir apparent.

The only problem with Dragonfire is the randomness with which the treasures appear. Player One may find

himself in a room with 400 points worth of booty while Player Two may draw a room containing only 200 points of possible loot. The point spread is never too great, though. The really high-point stuff, like harps and diamonds, won't appear until you've cleared out a room or two already.

Speed and agility are the key skills here, if you want to keep from getting toasted. He who hesitates is burnt.

If you are facing an impossible combination of fireballs on the bridge, you can sometimes squeeze through them by jumping from a crouching position.

SMITHEREENS

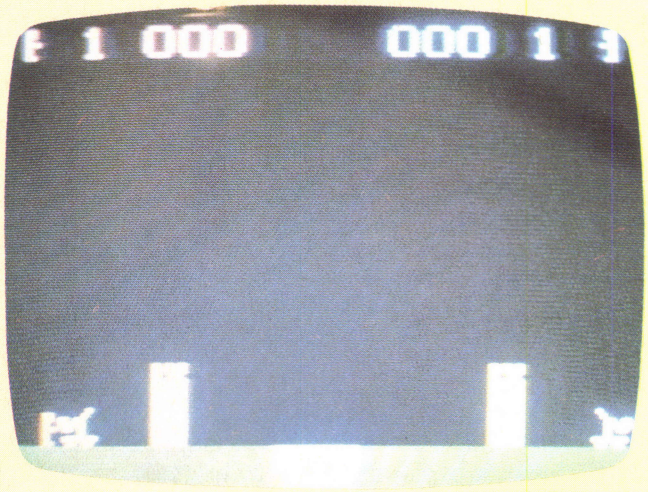
Odyssey/Odyssey²

By Art Levis

It's not exactly Camelot, but the setting's real enough to simulate those days of yore when stoning thy neighbor's castle was a favorite way to while away the knights. The concept is simple enough—use your catapult to lob huge boulders over a lake and smash the opponent's castle (three points for each direct hit), his soldier (seven points) or his catapult (13 points).

To get your rocks off, push the joystick in any direction, then release it. And therein lies the trick; the longer you hold the joystick, the further your boulder carries. If you're using the new Voice of Odyssey synthesizer module, that little electronic guy inside provides a running commentary on your skills, or lack thereof. Fall short of the castle, and he'll give you the following monotone tongue lashing—"Come on turkey, hit it!" Fall in the lake and you get, "You blew it!"

Try as I might to understand one sarcastic crack, I remain baffled. Each time my boulder fell on the empty battleground twixt castle and catapult—scoring no points—Odyssey replied in high dungeon (groan!): "That's easy!"



Each game consists of 10 separate battles, and at the end of a game the victorious side is rewarded with the electronic equivalent of a medieval trumpet fanfare. The loser simply waves a white flag.

Smithereens offers three different play levels, with the catapult tension release becoming tighter and the release time faster at each succeeding level. Wait until your opponent is otherwise distracted (everytime you hit his caapult, he's forced to run off screen for repairs), then sneak a peek at the second hand of your watch. In the first play level, two-second joystick release time will clobber the castle, while 2.5 minutes will deep-six his soldier.

If you find looking at your watch a little too obvious, the same thing can be accomplished by counting to yourself. I tried it ("1,001, 1,002..." etc.) and discovered I could score direct hits on my foe's castle four out of five times.

Don't lose valuable time by waiting for your boulder to hit (or miss) the target before re-arming. The instant your stone's away, push the joystick back into position and begin piling up seconds.

Use your first salvo to blast the enemy's catapult. While he's out getting it fixed, you can bomb away at his castle unmolested.

AMIDAR

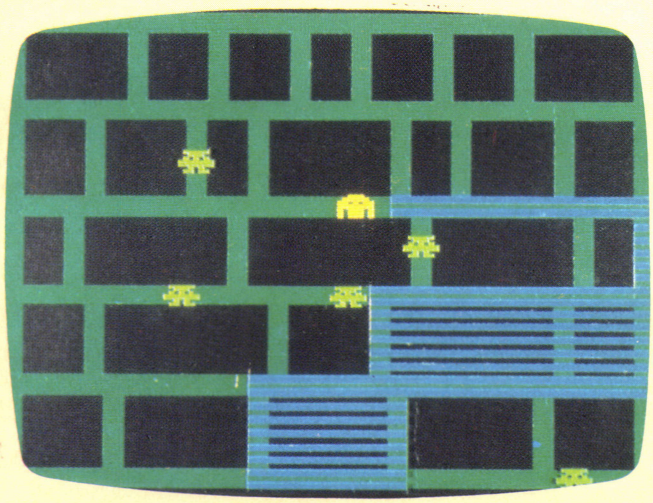
Parker Brothers/Atari VCS

By Mark Brownstein

As we all know, not all arcade games survive the translation to the home format. What Parker Bros. did with *Frogger* (made it into a wildly successful home version), it did not do with *Amidar*. Perhaps this is because gorillas, being higher up the evolutionary ladder, are more difficult to reproduce than frogs. Who knows? What we do know is that *Amidar* is a disappointment.

Amidar, the VCS version, consists of two variations of the same playfield. As in the game Dots, in which you have to connect dots to form squares, in *Amidar* you have to maneuver your "gorilla" (who looks nothing like one) around four sides of a square while avoiding pursuing warriors who move faster than your gorilla. If they get too close you can press your fire button and they'll harmlessly pass through you for a second or so. But be judicious; you only have four opportunities to do this for each gorilla.

Each time you complete all four sides of a box, it takes on a "jail cell" appearance. When you complete



all four corner boxes, the warriors turn into chickens. If your gorilla runs into the chickens (or vice versa), you get bonus points.

Once you complete the Gorilla board, you get a chance to do the same thing with pigs on a paint roller board. This board is identical to the gorilla board, except that the colors have changed, you're steering a paint roller and your pursuers are pink pigs. Again, if you fill the four corner boxes, the pigs become chickens in a maneuver that would have Charles Darwin thoroughly confused.

As you complete each box, you score points. Again, getting the chickens is also worth bonus points. But so what? The game is slow moving; when you lose a warrior (or paint roller) you must wait for what seems like 10 minutes before the game starts up again. You also have to fight the tendency to hit the fire button, which sometimes starts the action, but costs you one of your four chances to escape.

The game controls are not good; in order to negotiate the turns you wish to make, you have to turn *before* you need to, and often have to go back to make a second try. I tried the game on everything from the standard Atari all the way up to the Wico joystick and didn't notice much difference. The game is *slow*. With practice, you might get good at it, but, again, so what?

The arcade version plays a lot faster. When you move the joystick up, down, right or left, the gorilla (which looks something like a gorilla) actually moves up, down, right or left. The paint roller, pigs and warriors all look something like what they're supposed to.

If you want a slow, boring strategy game, with difficult controls, Parker Brothers' *Amidar* is for you. If not, save your money.

Study the motion of the warriors: they always turn corners. If you stay at least two corners ahead, they probably won't get you as quickly.

PHOENIX 1111

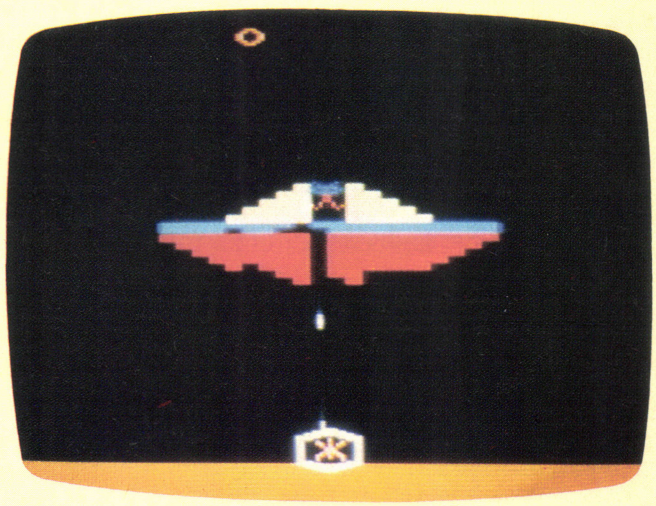
Atari/Atari VCS

By Noel Steere

Recently, Atari has picked up a lot of arcade hits and converted them into home format. And, believe me, they've made up for the sin of *Pac-Man* and then some! Especially on the newest arcade to home translation, *Phoenix*. It is great.

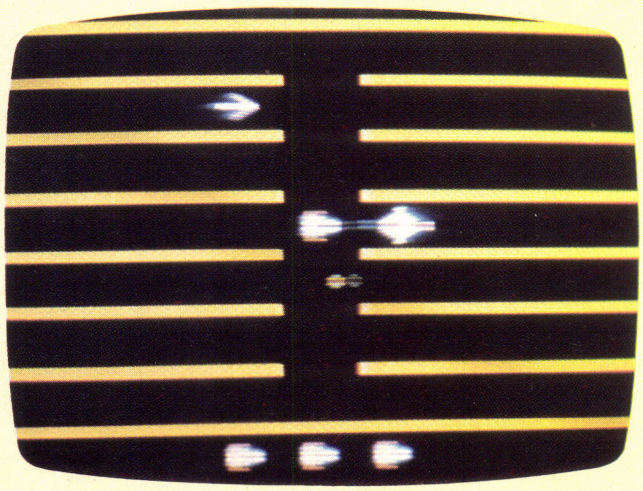
As many of you may know, *Phoenix* is the blast-the-bird game which has three scenarios: First, blast two formations of eight birds; second, destroy two sets of eight big birds which must be hit in the middle of their bodies because if you hit one of their large wings only, the bird will simply lose it and it will eventually regenerate and third, the mother ship sequence which is the hardest.

It isn't that the mother ship herself is so deadly. It's what's inside the ship that's important—the alien that's been causing you all the trouble. The only way you can destroy him is to first create a pathway to him by hitting the ship's barrier. Each hit destroys a block of the area and after you've destroyed the bulk of the barrier you'll come to a second barrier—a blue strip.



Phoenix is a perfect arcade adaptation. The birds look exactly like they do in the arcades and they split apart just as they do in the arcade version. The sound is beautifully done (if you don't like the sound that the birds make, however, you can just flick the left difficulty switch to "A" and it will stop) and the mother ship behaves exactly as it does in the arcades.

Try to hit the big birds when they're closer to your ship. This will give you more points and get you a free ship at 5,000 sooner.



TURMOIL ★★★½

Fox Games/Atari VCS

By Randi Hacker

Turmoil may very well usher in a new era of games which place a spaceship inside what appears to be a high-rise building. The tenants of this building, far from being elderly people in favor of rent control, are, instead, armored tanks and other enemies with lasers.

The set-up is like this: Your ship travels up and down in an elevator-type shaft located in the middle of the screen. Stretching to the left and right of this shaft are floors—separated by pink lines. Rumbling down these floors are a variety of things—armored tanks and enemy spacecraft among them. You must shoot at them by pressing the fire button (your shots travel in the direction in which you move the joystick) in order to destroy them before they destroy you. They do this by hitting you with their fire or by ramming into you if you should be so unfortunate as to be caught in their path as they move from one side of the building to the other.

Every once in a while, a little treasure appears down at the very end of one of the corridors. Using the joystick, you've got to steer your spaceship down it and touch the prize in order to earn bonus points. This has to be done with some haste because, after a certain amount of time, even the treasures turn on you. Let that be a lesson about materialism.

The tanks are by far the trickiest of all. You can't destroy them if you hit them while they're moving toward you. All you succeed in doing then is knocking them back a few inches. They've got to be hit as they retreat if you want to destroy them.

The graphics are bright and lovely, the action, fast-paced and furious and the idea of flying around in the high-rise of your choice, a captivating one. In all, the game is a lot of fun.

Race your ship up and down and fire all the time. Don't bother stopping and aiming down a corridor. Just fire all the time in both directions.

CARNIVAL ★★★

Coleco/Colecovision

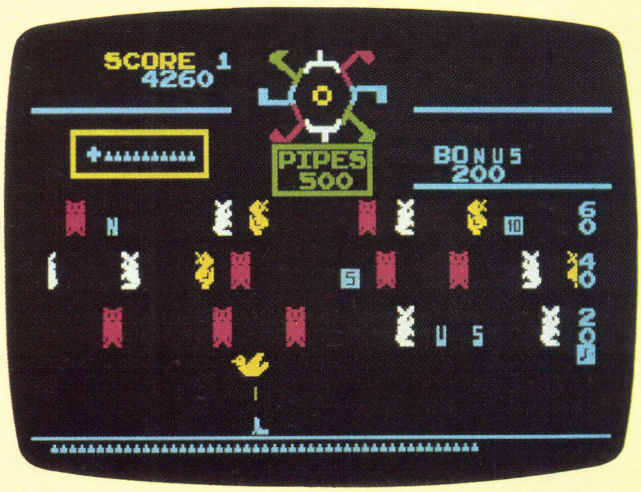
By Raymond Dimetrosky

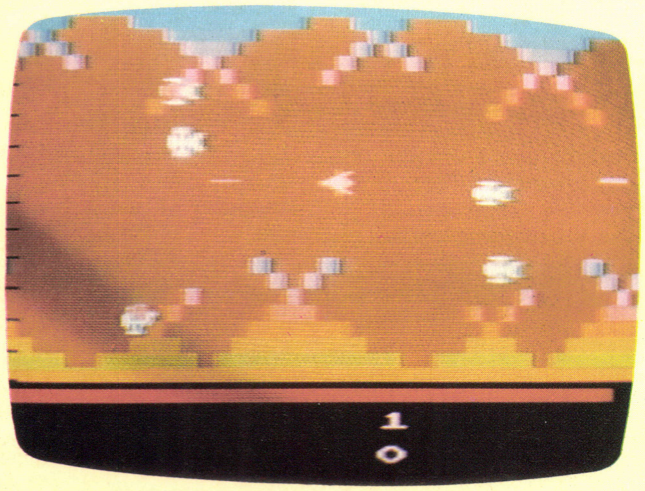
At one time or another you have probably had the fun of shooting at metal ducks, bears and rabbits in a carnival's shooting gallery. Well, the folks at Sega figured that you probably had so much fun at the carnival, that you would just love to have the same experience in an arcade. So they invented *Carnival*, an electronic shooting gallery. And then it was Coleco's turn to take a crack at it. They've transformed the contest into a home version and they've done an outstanding job in the translation.

The rules of *Carnival* are basically simple. You must shoot the targets as they pass in front of you. Besides the ducks and rabbits, the target range includes numbers and letters. If you hit the numbers you are awarded extra bullets, while if you hit the letters and spell out the word bonus, you are rewarded with a number of extra points. There is also a plus-minus target which, when hit, is worth the amount of points or bullets that are showing at the time. But if you happen to hit this target when a minus sign is visible, beware. You will then be a loser instead of a winner. The most important targets in the game, though, are the ducks. If you do not succeed in eliminating them as soon as they appear, then they'll give you a real surprise. One by one they'll swoop down and eat up ten of your bullets! Whenever you clear an entire gallery of targets, you get a chance to try the bear rack.

The Colecovision version of *Carnival* includes all the charm of the arcade game. The graphics are excellent, and the sound effects are outstanding.

Whenever there are chances to earn extra bullets, ignore what you were shooting at and go get them.





VANGUARD ///

Atari/Atari VCS

By Howard Polskin

Vanguard sounds like it's the latest cigarette. Actually, despite the bland title, it's one of the better video games I've played in recent months.

The object is to pilot a spaceship through seven zones (i.e. screens) and reach a mysterious city to battle the evil giant, Gond. After traveling so far and so long (10 minutes in video game time) it's a letdown to find that Gond is a pretty cheesy looking creature and that the showdown lasts a brief second or two. No matter. Taken as a whole, *Vanguard* is a splendid space odyssey.

Each zone that the ship flies through looks different and has different aliens attacking it. In the Mountain Zone, for instance, your ship zooms thorugh space as enemy spacecraft attempt to crash into it. The spaceship has some interesting defenses that show off the ingenuity of the Atari designers. Not only can the ship shoot in the forward direction, it can blast aliens on both sides and the rear of it. Also, in the Mountain Zone, there are some energy pods nestled along the flanks of the flight path. If the spaceship manages to brush against it, it will then have the temporary ability to fly into and destroy enemy spaceships without losing one of the five vessels in your fleet. It's a nice touch in a game filled with similar nice touches.

There are other wonderful screens and plot devices too numerous to mention here. But the game amuses and challenges at every turn. My only complaint is that the background that the spaceship flies over is a drab brown-grey. There's not a twinkling star to be seen. The spaceship looks more like a tiny fly maneuvering on the wall of a brick factory than a majestic vessel soaring through the vast beauty of outer space.

The instruction manual is easy to understand and *Vanguard* is a space journey worth taking.

In the Bleak Zone, you can dock into one of the snakes and rack up serious points but don't dock more than twice. The third time the snakes will destroy your ship.

GOPHER ///

US Games/Atari VCS

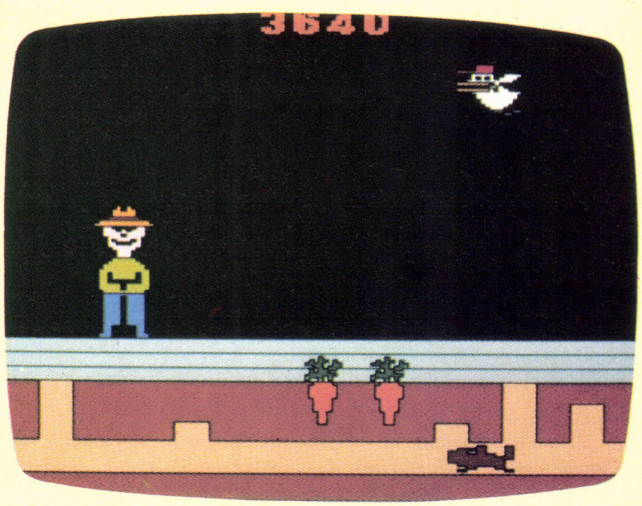
By Marjorie Crane

One of the major criticisms leveled at video games is that they have no social consciousness. Let's be honest folks. Firing lasers at hostile aliens, aiding homesick extra-terrestrials, or hunting for treasure in the steaming jungles hardly acquaint the videogamers with some of the burning issues of contemporary society. At last, however, a video game has emerged which is unafraid to expose one of mankind's worst threats. I'm talking, friends, about gophers. Finally . . . reality!

Unfortunately though, reality is not always exciting. *Gopher* is a graphically pleasing yet rather dull playing game. You are a farmer pitted against a nasty little gopher who is trying to destroy your freshly grown carrots. Your task is to protect your crop by pouncing on this pest. With shovel in hand, you move left to right, filling holes that the gopher has made. If you are not quick enough, he will get through and go straight for a carrot. You do have a chance to replant, however, as a friendly duck (who oddly enough resembles Groucho's sidekick from *You Bet Your Life*), flies overhead and sends down a seed which you must plant. These seeds, however, are very difficult to catch while trying to keep the gopher away.

Exciting as this game may sound, *Gopher* becomes quickly dull and unchallenging, although the music is charming and the sound effects quite realistic. The game screen never changes and the action therefore is very limited. I admire U.S. Games' attempt to bring us a slice of life, but in the final analysis, the crop isn't worth saving.

Don't stray too far from the center except to move left and right for an occasional pounce.



RICOCHET ♪♪♪♪

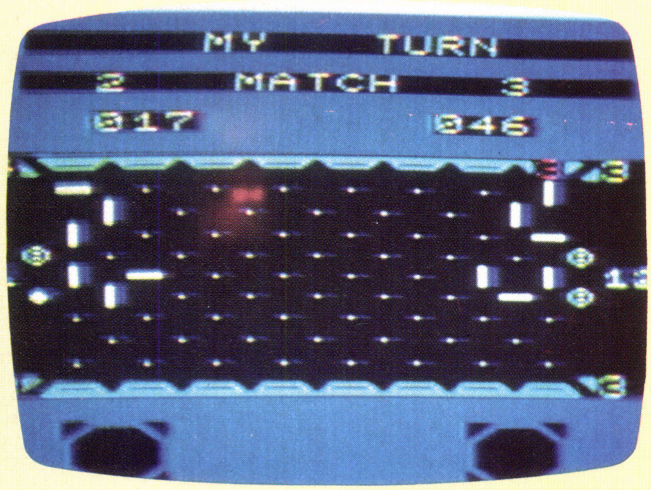
Epyx/VIC-20 (with 8K RAM)

By Walter Salm

For once, a game company wasn't afraid to release a game cassette for the VIC that requires memory expansion. This one needs an extra 8K, so I plugged in my 16K expansion cartridge and loaded and got quite a treat for my efforts.

Ricochet is one of those rare creations—a game that combines strategy with high-speed play and lots of excitement. You can play against the computer or against another human. Either way, much of the game play is unpredictable.

Each player has six paddle-shaped targets at opposite ends of a gallery that looks like a bowling alley. When you or your opponent fire a ball and it hits something, it ricochets at a 90-degree angle. For each of the targets you hit, you get a point. Behind the targets are bumpers that have higher point values and if you hit one of your opponent's corner shooting positions, you



get even more points in addition to sealing the position so it can't be used to launch more balls.

Whenever it's your turn, you have the option of either shooting or moving your targets to different positions as a strategy maneuver. This is a real computer game, with no joysticks involved and you're constantly faced with choices and gameplay decisions.

The scoring is fast and furious, and I can't pretend to understand all of the point scales, but don't worry; the computer keeps track of the score for you with incredible impartiality and accuracy. Like tennis, games are scored with match points and, at the end of a game set, you receive a rating and final score.

There are several difficulty levels, and umpteen variations of gameplay that you can choose from. The game itself is so complex and so fast-moving that it's possible to spend many hours trying to outwit either the VIC or your human opponent.

If you play against the computer, the VIC always uses its first turn to move its playing targets. You can take your cue from this; don't play with the targets in their original positions if you can help it.

PROTECTOR 2 ♪♪♪

Synapse/Atari 800

By Paul Backer

Some people say that 1982 was the year of the sequels. Synapse's contribution to the sequel craze is *Protector 2* and, as hard as it may be to believe, it is the sequel to Synapse's classic, *Protector*.

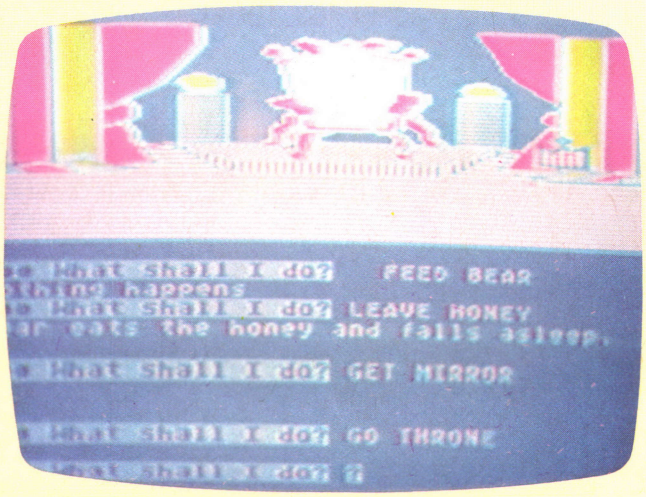
The idea of *Protector 2* is to save the people (all 20 of them) of a great city from being kidnapped by vicious aliens who, besides fishing, also enjoy throwing a human or two (or four) into a volcano. You, of course, are the city's only defender and have to pick up the citizens of the beleaguered city and carry them to the relative safety of the city of New Hope. Then you have to pick them up again and carry them to a secure mountain fortress, which for some inexplicable reason is full of enemy cannons and missile bases. To keep you from being bored outside the fortress, there is some native wildlife which enjoys flying around and munching up the occasional fighter as well as laser cannons and missile bases on the ground.

Protector 2 has some excellent features like being able to decide how many ships you want to start with. You get to choose a set of three or five. You also get to pick the starting level of difficulty, ranging from one to six. The game also has some very nice special effects, such as gravity and the way your man parachutes to safety when you get hit.

But there are some things missing from this otherwise excellent game. For example, you can't shoot the laser cannons and the missiles can only be destroyed when they turn red, which happens roughly every 50 years or so. The game would have been much, much better if there was more opposition

Frankly, *Protector 2* doesn't have the potential to generate the same cult following as the first but that doesn't mean it's a bad game. Considering the state of the games' market today, it is one of the better buys for the money. I have to admit that I prefer the original.

You can fly right through buildings without suffering any damage, so you don't have to maneuver around them.



ADVENTURELAND ♪♪♪

Adventure International/Atari 400/800

By Walter Salm

Whether you like adventure games or not, you owe it to yourself to look at this one. Unlike the "pure" adventures, this has graphics (pictures) along with the text. About half the screen is filled with graphics, while the lower half gives you a printed description of where you are, what you see and which escape routes are open to you. If you don't like to read, the game disk is also programmed to run a Votrax speech synthesizer.

This is not the sort of game for the impatient. You have to learn the limited vocabulary that the program can understand, but once you do, you can start your treasure hunt in earnest.

The simple vocabulary consists of two-word commands such as "GO HOLE" which really means, "Go into the hole." As you explore, you acquire tools and useful items along with your treasures. With your axe, you chop down a tree, whose hollow stump becomes the storehouse for all your collected items.

You use these items in some interesting ways—such as the mud to keep you from getting stung while you collect the swarm of bees—presumably to sting the dragon. You collect a pot of honey which you can feed to the jumping bear.

There's no time pressure during this game, and you can save it on the disk to resume play at a later time. The directions tell us that one game can easily take five to ten hours to complete.

In the course of your explorations, you collect some swamp gas in a wine bladder which you later ignite to blast a hole through a bricked-up doorway so you can get into the mysterious caverns, where you have to light your lamp so you can see. At times like this, you discover that all those items really do come in handy. If you're a string saver, you'll especially like the packrat that you have to become. In the caverns, you stumble on a royal anteroom, and then a throneroom, and all the time you're busily scooping up such treasures as the crown, a diamond ring, and others.

One other special feature: in the Atari version, you can print out a record of your adventures to record inventories and transactions. This is the first game I've seen that lets you do that. Overall it's fun, engaging and interesting, and is a good choice for your first, second or tenth adventure game.

MONSTER MAZE ♪♪♪

Epyx/Atari 800

By Paul Backer

There is a type of game that never reached the arcades or the home video game markets. It's not the adventure game. It's, of course, the 3-dimensional maze game. *Monster Maze* is a new entry to that class of classic games. Unfortunately any 3-D maze game is instantly compared with other 3-D maze games, among them *Wizardy*, *Asylum* and *Deathmaze 5000*, to name just an outstanding few. And, even more unfortunately, *Monster Maze* just doesn't make it when compared to its competition. This is not to say that *Monster Maze* is not a fine game. It is. It just falls short of it's predecessors' appeal.

The object of *Monster Maze* is to clear a maze of gold bars while avoiding monsters that run around the maze. In case you really get stuck, you can use a teleportation door which will take you to a new maze, and if you are ever lost, just press the joystick button and you will see an overhead view of the maze you are in. After clearing a maze, you advance to a new, more difficult level. All together there are eight different skill levels, which means that the higher the level, the faster the nasties move. The part that I really hate is that you can't kill a monster on the levels higher than six, because they travel twice as fast as you do.

It's hard to put my finger on it, but there's something definitely missing from this game. Maybe it's that the mazes are too complicated. Or maybe it's because the omnipresent vitamin pill which bestows the eater with super powers always wears off just as you are about to kill a monster. Or possibly, it's the fact that you have a jump feature, which is absolutely useless. You can't jump over a monster and why would you want to jump over a vitamin pill? It's just that you feel that *Monster Maze* could have been much better.

Overall, *Monster Maze* is not a bad game, it just sort of falls short of your expectations. Nevertheless, if you already own games like *Wizardy* or *Asylum*, *Monster Maze* would be a good addtion to round out your collection if only because of its excellent graphics.

On the lower levels when you encounter a monster, don't try to jump over him, just turn around and walk away. On the lower levels they don't react fast enough to get you.

CAVERNS OF MARS ♪♪♪♪

Atari/Atari 400/800

By Phil Gerson

Caverns of Mars is an exciting, fast-moving adventure game for the Atari 400/800 home computer (for now it is available only as a computer disk program). The game plot is simple. The player must maneuver his one-man fighter down into the depths of Mars, activate the timer of a fusion bomb, and escape before the bomb goes off.

The game starts with the selection of one of four skill levels, Novice through Commander. Instantly, the fighter (very reminiscent of the fighters flown by Cylon raiders in the TV show *Battlestar Galactica*) starts its descent into the deep Martian cavern. The speed of the descent and left-right motion of the fighter are controlled by the joystick, while the action button fires the twin wing-mounted laser torpedoes. The game graphics are quite good, with both the fighter and the scrolling accomplished smoothly and clearly.

Depending on the skill level selected, the player must penetrate two to five different caverns to reach the bomb. The first cavern has no defenses, but winds treacherously. Its walls are lined with rockets, radar installations and fuel tanks—targets for the fighter's lasers. Hits score points, and the destruction of fuel tanks adds to the player's fuel supply. The fighter can't carry enough fuel at the start to complete the mission.

In cavern two, the fighter must blast and weave through waves of missiles. Some are rockets, others (in red) are fuel carriers. Cavern three boasts laser gates—fiendish devices that flash lethal energy across the entry channel. They are immune to the fighter's torpedoes, so they must be timed and sped past. Cavern four is the home of deadly space mines, white diamond-shaped objects that jump around while trying to explode against the fighter. These can be either avoided or shot, but neither defensive ploy is easy, as their movements are unpredictable. Some of the mines are invisible at times, making them even more dangerous.

Only on the Commander level does the fighter have to pass through Cavern five, which is actually a maze-like section of a Martian city. It is especially treacherous, requiring incredible dexterity to navigate, plus split-second timing to destroy the fuel tanks that block the way. And, of course, getting to the bomb is only half the job. Getting out safely requires a high-speed back tracking through the same mazes and winding cavern walls, though there are no rockets, lasers or mines to dodge this time.

Regardless of the starting level, you get five fighters to complete the mission. Contact with a cavern or city wall or anything else on the way up or down, or running out of fuel, costs you one fighter. When you lose one, the replacement starts the mission back at the entry to the cavern even if you were only a hair's breadth away from the exit when destroyed. This can be particularly frustrating when you are learning to play and find yourself having to fly the same segment of the mission over and over.

The one disappointing aspect of *Caverns* is the conclusion. The reward for a successful mission is the display of the points you accumulated, and after a nerve wracking game, that's a bit of a letdown.

> Some laser gates have multiple beams. The only way through them is one at a time. Pause between them as they flash on and off.

MICROWAVE ♪♪♪♪

Cavalier/Apple II

By Marc Wielage and Larry Yeager

Think of the science-fiction movie *Alien* crossed with John Williams' *Star Wars* music and an old-time comedy. That comes pretty close to describing *Microwave*, an exciting maze-type that's topped the Apple computer charts for the past few months.

In this game, little Teddy, an inept but well-meaning space mechanic, has to go through a series of twisting corridors and pick up dozens of wrenches, hammers and other tools that he needs to fix his ship. Unfortunately, the hallways are also filled with four hungry monsters that can gang up on and eat Teddy. Even worse, some of the monsters have a bad habit—they drop deadly eggs that explode a few seconds later just like grenades—nasty. Really nasty.

But unlike *Pac-Man* and all its other standard clones, this game gives the player a valuable weapon: a deadly microwave dish (hence the name) used to vaporize any evil creatures on your heels. These dishes can only be dropped one at a time, and after using them, you'll need to recharge Teddy's batteries every so often by gobbling up a power pack, one of which is provided on each level.

While the monsters aren't that much of a challenge on the first level, the ones on the second move about twice as fast and give poor Teddy a real run for his money. Expert timing and fast reflexes are about the only thing that will save you from disaster, and the player will have to resign himself to playing the game for quite a while before determining the best patterns to play. Level two is a particular toughie, requiring split-second thinking to get the baddies behind you so you can zap them all with a single microwave blast. Teddy himself is protected by his space suit for short jaunts through his microwave ray, but if he stays in there too long, his strength weakens and he'll ultimate-

ly succumb to the lethal radiation.

The sound effects and music are excellent—formidable accomplishments, considering the ridiculously tiny internal Apple II speaker—featuring strains of the *Cantina* song and familiar silent movie themes. If the music starts getting on your nerves after a while you can use the control "S" option to silence it. The player may use either the Apple keyboard or an optional joystick.

No matter which way you decide to play *Microwave*, we predict even experienced computer gamers will have their hands full. There are no less than 26 levels, made up out of a variety of five different maze types—possibly a new record for games of this type. We could only make it up to level nine or 10 before getting wiped out—and even that was a difficult achievement, requiring weeks of practice and pattern-planning. Offhand, we'd say *Microwave* is the ultimate maze game for the Apple to date, and is worthy of our highest recommendation. It will be available for the Atari 400/800 shortly.

NIGHT MISSION PINBALL ♪♪♪♪

Sublogic/Apple II+

By Marc Wielage

Pity the poor pinball freak. In this high-tech age of digital electronics and video screens, the era of mechanical coin-slot games seems to have about had it—a victim of the same kind of technological obsolescence as the horse and buggy or last year's skateboard model.

It had to happen, sooner or later. Somebody—in this case, SubLogic—combined the best ideas of electronics with a realistic video pinball game, and the result—*Night Mission*—is a real winner. Up to four people can play at a time, with each of their scores registering independently on four eight-digit readouts.

The player has the choice of either using "Z" and "/" on the keyboard or two optional paddle controls to activate the pinball paddles located at the bottom of the screen. To start the game you have to "insert" quarters. This is done by pressing "Q" on the keyboard which causes several animated coins to drop in the slot like magic. (If only earning money in real life were this simple.)

The key word in describing the pinball action is *realistic*. There are twirling ball-slots, incredible sound effects, and even adjustable spring tension on the plunger. The ball movement is extremely realistic, with just the right amount of random movement to provide an almost perfect simulation of the real thing.

Even more astonishing is the fact that the designers thoughtfully included the means by which you can alter the playing parameters. For example, if the ball doesn't move fast enough for you, you can dial in a variety of different speeds in the game's "Fix" mode. Up to 30 changeable functions are available, making this a program that puts total game control in the hands of the player.

All things considered, SubLogic's *Night Mission Pinball* is a classic—*the* arcade pinball game. It's the new state of the art against which all the others must be measured.

ENCOUNTER AT L-5 ♪♪♪♪

Data Age/Atari VCS

By Walter Salm

This is a different sort of outer space shoot-em-up in several ways. First, you use the paddle controller instead of the joystick. The other difference is that you have continuous fire from your ground-based gun, which is called an "anti-matter launcher."

You start with four of these launchers, one on the firing line and three in reserve, and you direct your fire between the launcher and cursor.

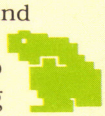
Just hold the paddle's firing button down and the thing fires like crazy. If you want to change the angle of fire by moving the cursor across the top of the screen, let go of the fire button for a second. The cursor will line up right above the launcher. It takes a little practice and coordination, but it works really well.

You're shooting at wave after wave of attacking Megalyte Warrior Ships which have an annoying habit of dropping laser bomb blasts. You have to be quick with the cursor reflexes. The higher the ships are on the screen, the more points they earn you.

Every so often a death ship appears, after you get fair warning with a "beep-beep-beep" alarm. Unlike the other attacking ships, if the death ship reaches the ground, you lose your anti-matter launcher. Here, you have to be especially adept at moving the cursor and keeping up a withering fire. There's no way to hide from a death ship.

There are 26 game selection settings—13 variations in both one- and two-player versions. Also, you can set up the difficulty switches for three different levels of game speed.

This is a good game with interesting sound effects and lots of continuous action. The lower playing levels are easy enough so you can rack up some impressive-looking scores even while you're practicing.



Keep your launcher in one corner and the cursor in the opposite corner for diagonal fire, until things get hot in one spot or the death ship appears.

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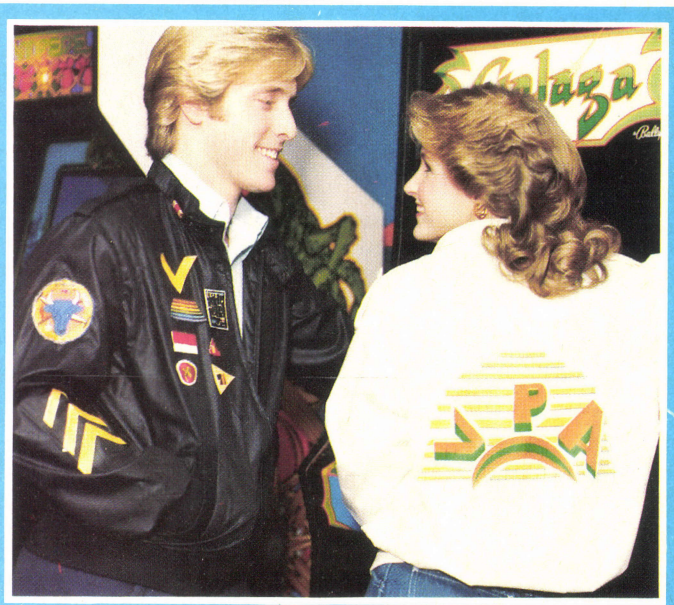

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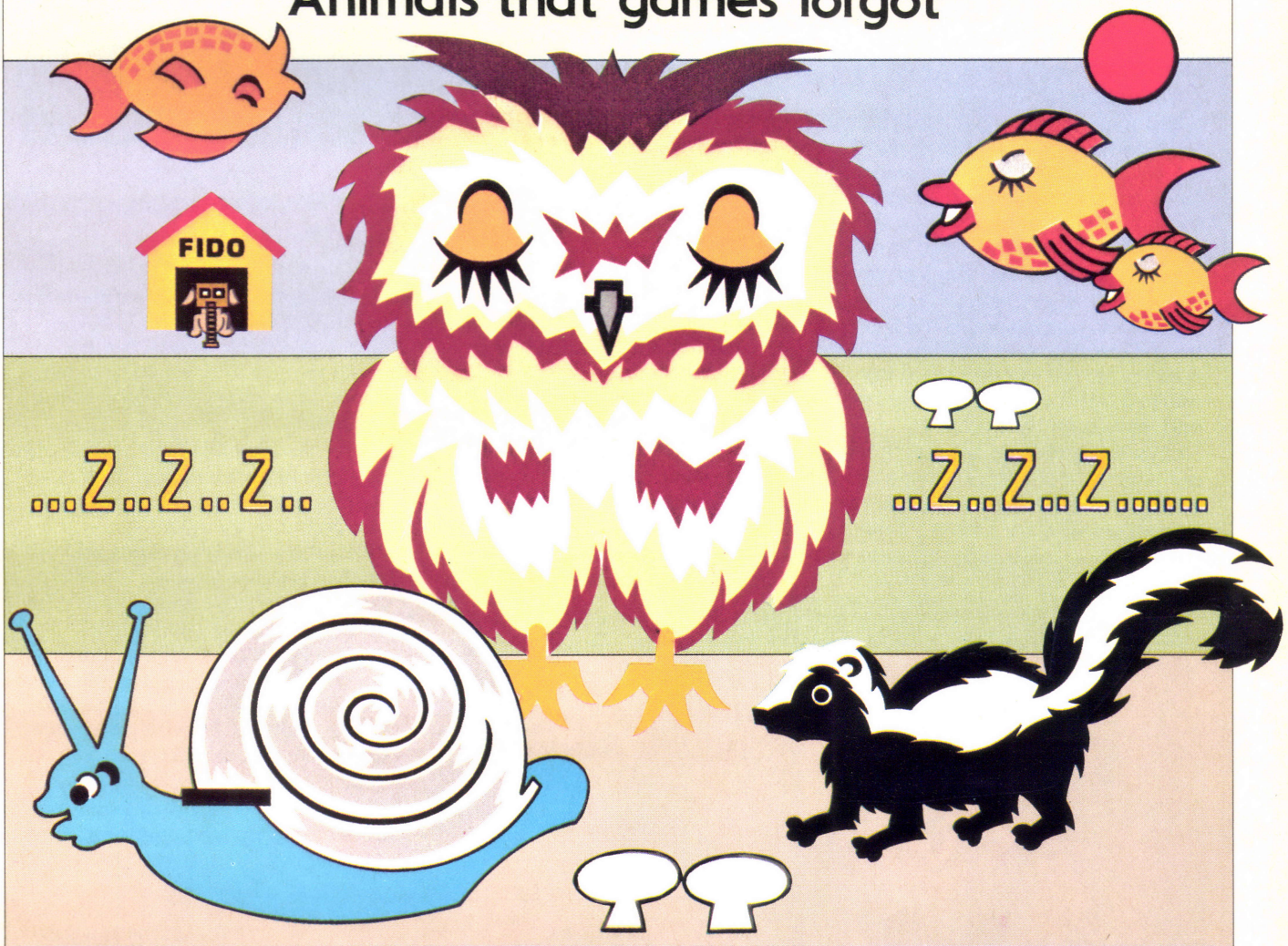
HEY! what about US?

Animals that games forgot



Animals are everywhere. If you don't believe us, just look around. There. There's a dog. Or evidence that one has just been there. Watch out. The very fire hydrants are testimony to the existence of dogs. And over there. That's a cat. And trees hold birds and sometimes cats. But while many animals are represented in video games, some species are not and we feel that this is a tragic oversight. Tragic. Something must be done about it and that's all there is to it.

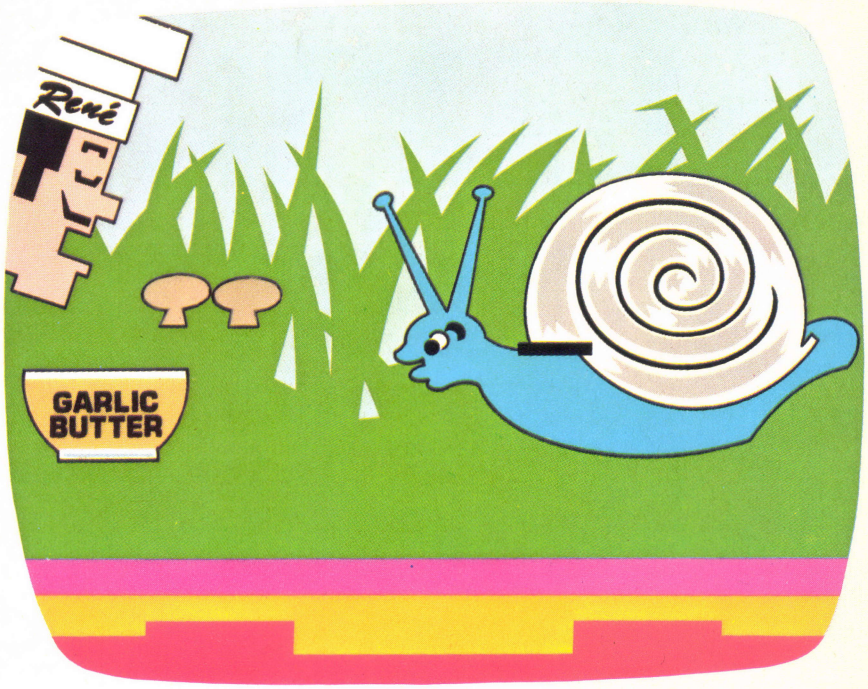
Illustrations: Bill Silbert

By Randi Hacker

Chickens! What's so great about chickens? This is not a question we would advise asking someone like Frank Perdue but, in general, it's a pretty good one if we do say so ourselves. Nothing, is our answer. So why has so much brouhaha been made over them in video games? *Freeway. Eggomania. Chicken.* And so forth.

And monkeys. Not content to be the first in outer space, they also have to be among the first forms of wildlife in RAM space. (cf. *Amidar, Monkeyshines, Donkey Kong* and *Donkey Kong Jr.*)

But what about owls? And three-toed sloths? And duckbilled platypusses? Wallabees? Bush babies? Mock turtles? All of these (and more, more, more) have been sorely neglected, and don't think they don't care. They do. Why just last week we here at the ERA (Equal Rights for Animals) received a letter from a marsupial in Alabama which read (in part): "Put $5,000 in unmarked bills in a brown paper bag and leave it on the corner of Hollywood and Vine or you'll never see your . . ." No. Wait. That's the wrong letter. Oh. Here it is. "Dear Sirs (opossums are nothing if not exceedingly polite) I know we're not the most exciting animals in the world. We do sleep a lot but we could make a very relaxing video game. What about it? Huh? Name withheld."



For too long certain animals have been badly neglected in videogamedom. Take SNAILS, the stars of the game pictured above. The object of this game is to move slowly. Very slowly. Below, we have OWLS, a game dealing with nocturnal birds. The object is to sleep during the day and stay awake at night while rotating your head 360 degrees.

This is only one of thousands of pathetic pleas we receive from animals daily. Doesn't your heart just go out to the poor little creatures? This type of out and out neglect just has to stop. There are other animals out there just crying for a place in history. To help designers get off to a good start, we've got a few games written here that ought to show them where the action really is. They're just rough, mind you and would have to be fleshed out some but it's a start. Chickens! Feh! Put your money on owls or skunks or snails or goldfish. Thank you.

OWLS

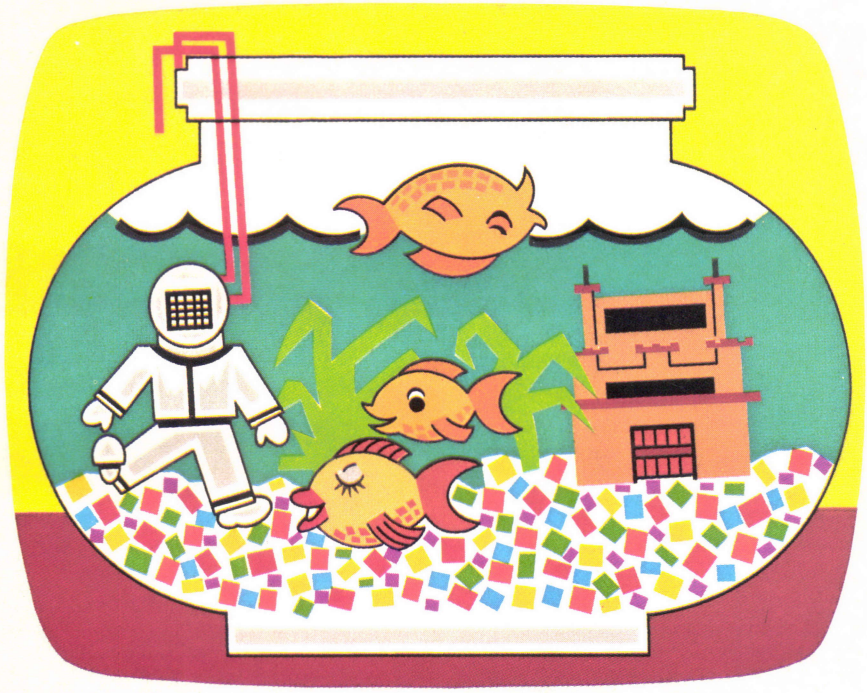
The object of this game is a simple one. Stay awake at night and sleep by day. Sound easy? It is. While the daytime sequence of the game is a little dull, nighttime really takes off. The owl's head turns 360 degrees and everything. Wow! Use your joystick to rotate the owl's head. Use the fire button to open his eyes. An optional maneuver is

rapid eyelid movement (REM) in which, by simply depressing the fire button continuously, the eyes automatically open. It doesn't have to be done manually. Thank goodness.

SNAILS

Granted snails are slimy, unappealing little creatures, but is this any reason to overlook them altogether? There's not much to them graphically but therein lies their beauty. It would leave a hell of a lot of memory to devote to game play. The object of this game of culinary skill is to maneuver a snail from the left side of the screen to the right and into a waiting receptacle filled with garlic and butter sauce. A French chef in one of those silly little white hats they always wear comes around now and then smacking his lips and muttering "Mangez mon chapeau!" This may sound unappetizing to you but a lot of people we know love snails. So don't let us hear you laugh. Chacun à son goût. In level two, things get tough. Instead of moving from right to left, you've got to move from left to right. Talk about disorientation! Clearly, speed is of minor importance here. Move slowly stopping often to rest. The game could last hours. And isn't that something we all ask of a video game? That it keep us occupied over a long period of time?

More forgotten species: Above, SKUNKS, a game of fear and loathing. You've got to stay inside come smell or high water. Below, GOLDFISH, perhaps the most overrated species in existence. For most of the game, the fish are alive. Then they die. At this point it is best to stop feeding them and start taking them out of the bowl and disposing of them instead.



SKUNKS

Skunks have long been snubbed by just about everyone. The object of this game is to keep your family inside the house while the skunk stands on the front lawn. Whatever you do, don't open the door. If you do, you'll have to move. Every once in a while, you can all peek out through the picture window to see if he's made any progress. If not, it's back inside to wait some more. What fun!

GOLDFISH

There are no predators and the goldfish don't come from outer space. If anything, they come from the state fair where they were won by tossing dimes onto cracked china plates. Now you've got these fish in a bowl in your room. All they do is swim around and around and eat and make a mess. Eventually they die. That's where you come in. You've got to remove them from the bowl with the net that's provided and flush them down the toilet located in screen two. This is a classic game of life and death.□

It's the REAL THING

Demon Attack *and* Phoenix. RealSports Football *and* M Network Football. Defender *and* Chopper Command. *Sure they sound different but once you get them home and on the TV screen they're exactly alike. Or are they? Would you be able to tell them apart?* EF *did an in-depth study of games that look alike and, in some cases, play alike. We determined the similarities (if any) and differences (if any) and evaluated them in comparison with each other. Are any better or worse than the others and, if so, how? Read the results of our video game taste test and see.*

Illustration: Jane Beaulieu

By Raymond Dimetrosky

As recently as a year ago the video gamer had it pretty easy when it came to deciding which cartridges to buy. If you liked space games, you'd simply go to the store and buy the one or two space games made for your system. No rough decisions. Well, today not only are there a number of similar games to choose from, but some of them seem to be virtually identical. What is the difference between *Star Raiders*, *Star Voyager* and *Star Master*? How can you possibly know which of these games is for you? Relax. Once again *Electronic Fun* will help clear up the confusion. We've tested a number of lookalike games for the Atari 2600, and now it's time to separate the winners from the losers.

Send In The Clones

If you read the descriptions of *Defender* from Atari, *Chopper Command* from Activision, *Space Jockey* from U.S. Games and *Bermuda Triangle* from Data Age they appear to be completely unrelated. Each has its own unique premise. In *Defender* you are trying to protect Earth from evil aliens, in *Chopper Command* your mission is to guard a truck convoy against enemy choppers and jets, in *Bermuda Triangle* your goal is to collect valuable treasures while avoiding hostile creatures, and in *Space Jockey* your objective is to shoot down the enemy while avoiding their fire. But look closer. These games are more similar than they initially appear to be.

For one thing, in each game you score points by shooting and destroying the enemy. It doesn't really matter whether your mission takes you deep into the

...or is it?

The clone game challenge

ocean or far into outer space; you are good and you must destroy evil. And whether you are piloting a submarine, a space ship, or a helicopter, the scenery is changing beneath you as you travel.

Let's examine them individually: The simplest is *Space Jockey*. You score points by shooting *everything* (including houses and trees) and as long as you avoid enemy fire, you get to play. At the next level of complexity you'll find *Chopper Command*. Although you shoot everything that is in the air, you must be careful not to crash into the trucks on the ground. You must also try to hit the enemy choppers and planes before they bomb your trucks.

Not complicated enough for you? Try *Bermuda Triangle*. While shooting at the enemy, you have to retrieve treasures from the bottom of the ocean and bring them up to your ship. But look out! You not only lose points when you are hit, but also whenever you bump into an alien. And if you should happen to smash into one of the hazardous objects, it's curtains.

Finally, for those of you into extremely involved games, there's *Defender*. While shooting various aliens, you must also protect your fellow humanoids. If an enemy mutant captures a humanoid, you must find the pair, shoot the mutant, and help the humanoid safely to the ground . . . or he'll turn into another mutant! If every humanoid is destroyed, your planet is demolished, but the game goes on. In addition to all of this there are smart bombs, and hyperspace, and . . . well, this game is quite involved.

Because of the differences (no matter how slight), each game may appeal to a different type of player.

Quickness Or Smarts?

If you want to test your reflexes rather than your mind, then *Space Jockey* may be for you. On the other hand, if you're prepared to study your radar and make lightning-fast decisions about hyperspace and smart bombs, check out *Defender*. *Chopper Command* and *Bermuda Triangle* are somewhere in the middle.

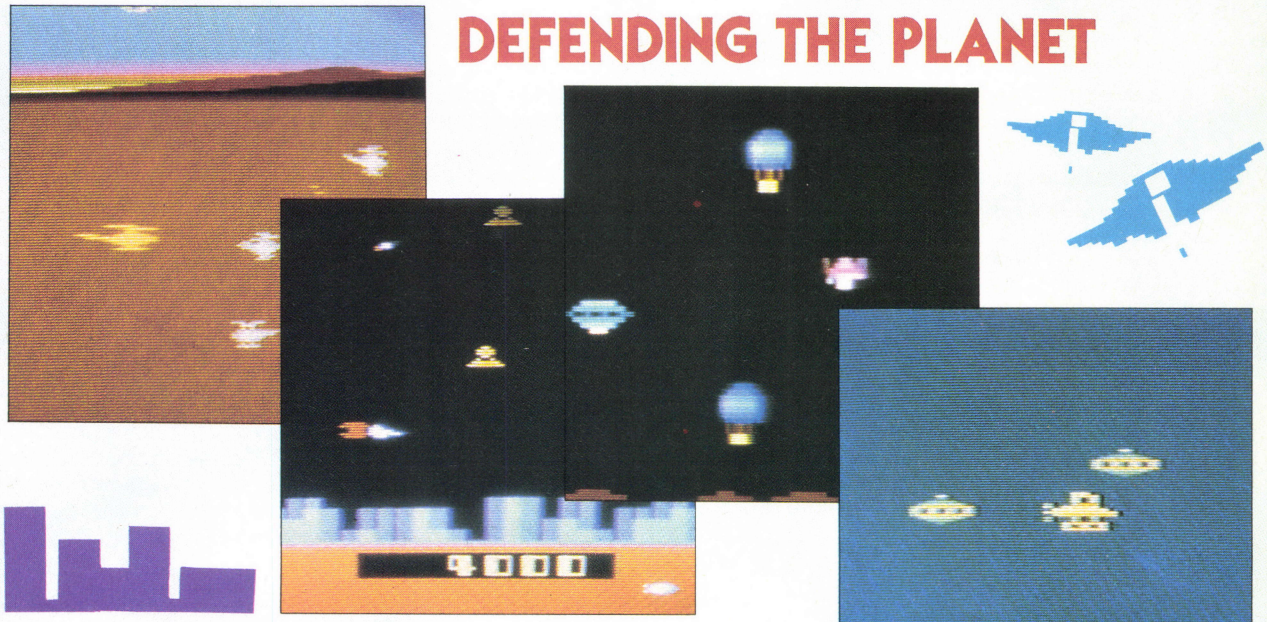
Both *Defender* and *Chopper Command* offer three features not included in *Space Jockey* and *Bermuda Triangle*. In *Defender* and *Chopper Command*, when you are soaring through the air and find yourself face to face with the enemy, you can reverse your craft, travel in the opposite direction, and fly off to safety. In *Bermuda Triangle* and *Space Jockey*, there's no turning back!

Another excellent feature in *Defender and Chopper Command* is radar. While you are traveling through a limited portion of the field, these games allow you to view the entire territory in one quick glance. This feature is particularly helpful in *Defender*, where it can be used to find one of your fellow humanoids who is being carried off to his doom.

What really sets *Defender* and *Chopper Command* apart are the waves of attackers. Instead of undertaking an endless mission, where the enemy gets faster and faster until you're defeated, you complete one wave of attackers and then advance to a harder one. Not only does this allow you to feel a sense of accomplishment (even if you are defeated) but it also gives you a few seconds of rest before your next mission. In addition, you earn bonus points.

The graphics are excellent in all four of these games, although in *Defender* there are so many things flying around that detail tends to suffer. The humanoids, for example, look more like square boxes than people. And when you are firing at the enemy, your ship actually

DEFENDING THE PLANET



The first group: (from upper left) CHOPPER COMMAND by Activision, DEFENDER by Atari, SPACE JOCKEY by US Games and BERMUDA TRIANGLE by Data Age. All of them have basic similarities but it's their differences that count and CHOPPER COMMAND and DEFENDER stand out.

disappears for a fraction of a second. In all fairness, though, the designers have done such a masterful job of retaining the flavor of the arcade hit that it's picky to complain.

Blue Laser

Chopper Command's creators deserve particular credit for their game's superb graphics. Not only do the helicopter propellors twirl, the tiny wheels on the trucks also turn as they roll along. And instead of boring black bullets, your ammunition takes the form of brilliant blue laser beams that light up the sky.

While each of these games has its advantages and disadvantages, *Defender* and *Chopper Command* are the real winners. The designers of each have expanded on the scrolling shoot-out theme to create contests with real personality. *Chopper Command* offers superior graphics in a real test of your eye-hand coordination, but *Defender* offers the greater mental challenge.

Our choice—*Defender* by Atari.

A few years back Atari created a computer game named *Star Raiders*. Since you had to use the keyboard to plan your strategy, most people assumed this would be one contest that would remain available solely to computer owners. Well, the ingenious programmers of the VCS managed to fool the skeptics, and now there are no fewer than five variations on the *Star Raiders* theme: *Star Master* by Activision, *Star Voyager* by Imagic, *Phaser Patrol* by Starpath, *Space Attack* by M Network and of course *Star Raiders* by Atari.

Since the five games are all extremely complicated, it would be impossible to describe each of them in detail. In general, your goal is to pilot a ship through space, while fighting off the enemy who is out to destroy you. But these are not just shoot-em-up games, these are computer games which require you to think and plan out strategies. So you'd better keep a close eye on your energy level, the damage to your craft and the location and number of attackers who remain.

As in the scrolling shoot-out games, there is quite a variance in complexity among these five contests. On the simple end there's M Network's *Space Attack*. In this game you don't have to worry about levels of energy or damage to your ship. If you are a fast and accurate shooter, you will probably excel. On the other end of the spectrum is Atari's *Star Raiders*. This game is so complicated it needs a sixteen page instruction manual.

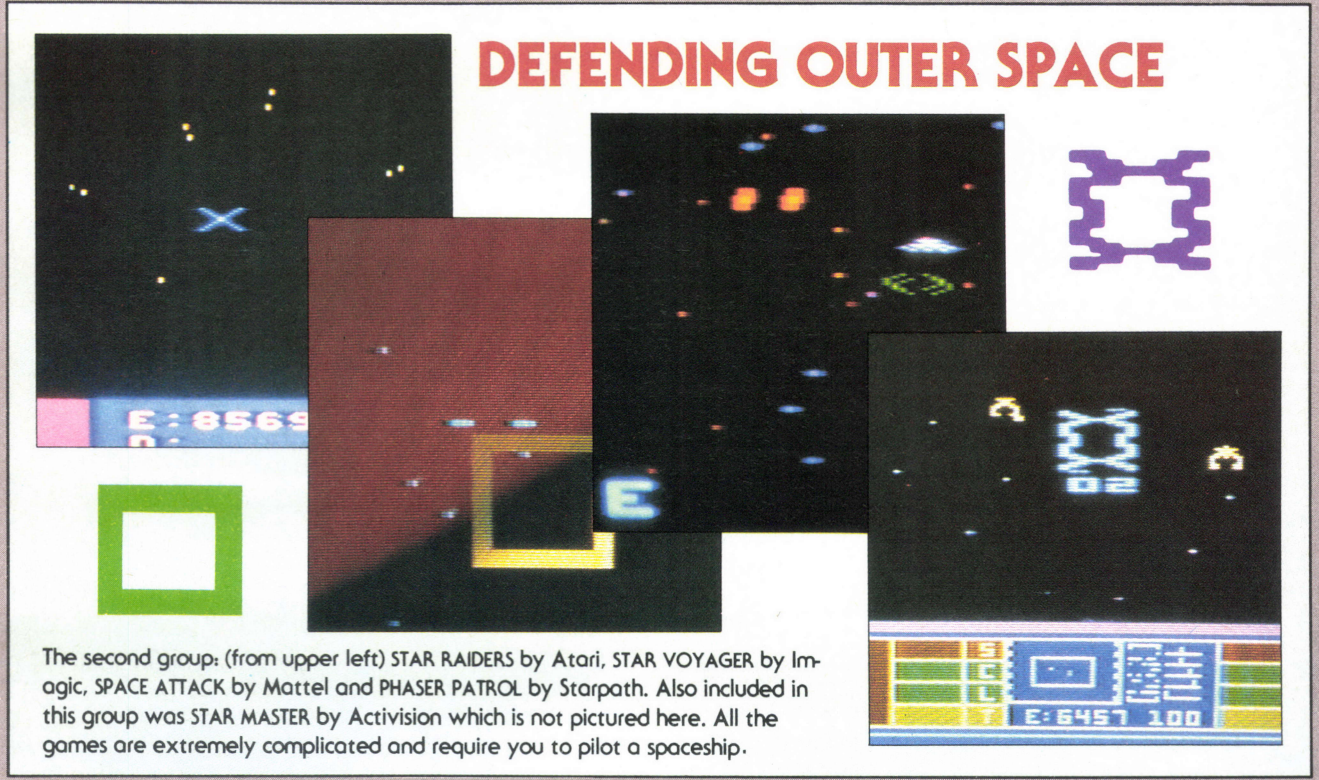
Complexity

For example, instead of just one report on damage to your ship, there are four separate indicators. You may have damaged your photons and completely destroyed your engine while your shields and computer are still functioning properly.

Star master, *Star Voyager* and *Phaser Patrol* fall somewhere in between *Space Attack* and *Star Raiders* in complexity, with *Star Voyager* on the simple side and *Star Master* nearly as complicated as *Star Raiders*. If you're the type of person who likes to sit right down and play a game without learning a lot of complicated rules, then *Space*

Attack or *Star Voyagers* will be more to your liking than the other three. But *Phaser Patrol* might offer the best compromise. Although it's extremely detailed it's also relatively easy to play.

Before you can kill an enemy you have to find him, so in *Star Raiders*, *Star Master* and *Phaser Patrol*, you must shift back and forth from a view of outer space through your ship's window to galactic charts or maps. With a quick glance at these charts you can easily identify enemy sectors, empty providences and sectors which include friendly star bases. How do you do this? The creators of the VCS version of *Star Raiders* took the most logical approach—-



The second group: (from upper left) STAR RAIDERS by Atari, STAR VOYAGER by Imagic, SPACE ATTACK by Mattel and PHASER PATROL by Starpath. Also included in this group was STAR MASTER by Activision which is not pictured here. All the games are extremely complicated and require you to pilot a spaceship.

they simply included a keypad with the 2600 cartridge. By plugging the joystick into the left jack of the VCS, and the keypad into the right jack, every control you could possibly need is at your fingertips. Because of the keypad, *Star Raiders* is one of the more expensive games. But since Atari promises future games which utilize the keypad, *Star Raiders* might be one of your better investments.

The creators of *Star Master* have kept the cost of their cartridge down by using the color black-and-white switch on the VCS to jump from one play field to the other. Starpath uses the difficulty switches to do the same thing in *Phaser Patrol*. *Phaser Patrol* is also a premium priced game, however, since it's packaged with the Starpath Supercharger. This increases the VCS's memory and graphics capabilities through the use of a standard cassette tape recorder. This makes it another good investment.

With the exception of *Star Voyager*, which has two different two-player versions, these are one-player games. *Star Raiders*, *Star Master*, *Phaser Patrol* and *Star Voyager* all reward your successful completion of each mission with a ranking or score, but this is one feature noticeably missing from *Space Attack*.

Fleet's Too Big

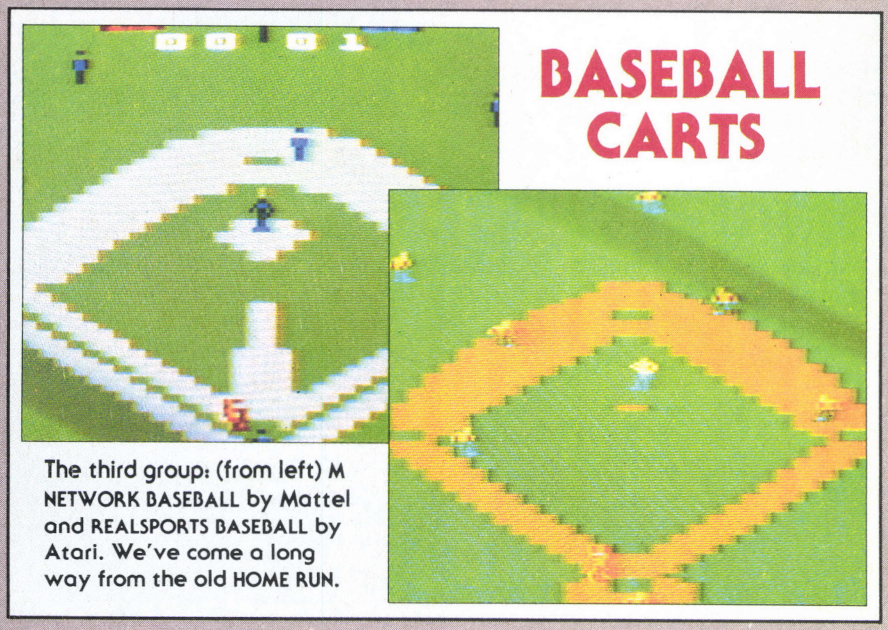
So much for the similarities—what about the differences?

Star Raiders and *Star Master* offer more game levels. Instead of just speeding up the action in more difficult contests, they also increase the size of the enemy's fleet. As you improve, you really begin to appreciate this.

Another added dimension is radar. While all of the games claim to have it, only *Star Voyager*, *Phaser Patrol* and *Star Raiders* give you the luxury of a small radar screen that's visible even while you're doing battle. While the screens look impressive, they're not particularly useful.

This is not true of the friendly star bases you use for docking and refueling. In *Star Raiders*, *Star Master* and *Phaser Patrol*, when your ship is damaged or you are running low on fuel, simly turn to your galactic map, find the star base, make a quick pit stop and continue your mission. You must keep a steady eye on the status of your ship—if you wait a second too long to find your star base, you're a goner.

In Star Voyager you can also refuel (and advance to the next



The third group: (from left) M NETWORK BASEBALL by Mattel and REALSPORTS BASEBALL by Atari. We've come a long way from the old HOME RUN.

level) by finding a star portal on your radar and entering it. But this requires you to rely more on your reflexes (and a little bit of luck), than on strategy. One great feature of *Star Voyager*, though, is the choice of weapons; either a less powerful means of destruction requiring very little energy, or a bigger blast which uses up a lot of fuel. You can even hook up both joysticks and use each one as a different weapon.

Artful Dodger

All of these games have outstanding, colorful graphics. In *Star Voyager*, when you enter a space portal, the effect is truly out of this world—a flashing maze of colors until you reach your destination. Similarly, in *Star Master* you'll really feel like you're flying. The stars race past you at an incredible rate while you artfully dodge deadly asteroids.

But hands down, the most phenomenal graphics belong to *Phaser Patrol*. Look through your craft's window to track down the enemy and you know what it feels like on board a space ship, right down to the instrument panel with radar and a computer readout.

Our choice: *Phaser Patrol* by Starpath

Recently a new group of look-alike games appeared when Atari released its adaptation of *Phoenix*. Your mission is to destroy the mutant war hawks who are attacking the Earth, while protecting their alien spaceship. Imagic beat Atari to the home screen with its own bird attack game for the VCS named *Demon Attack*. Now that *Phoenix* is out, you, the video gamer, must make the choice.

Both games offer superior graphics and outstanding sound effects. The birds in both are extremely colorful and detailed. But *Demon Attack* wins the award for best graphics, simply because of its wide variety of attackers. Every wave greets you with a new, even more ghoulish set of creatures. Some of the Demons open and close their mouths, some of them twirl around sideways—you never know what to expect next. As chilling as the squawking bird-sounds in *Phoenix* are, they can't equal the sounds in *Demon Attack*.

Force Field

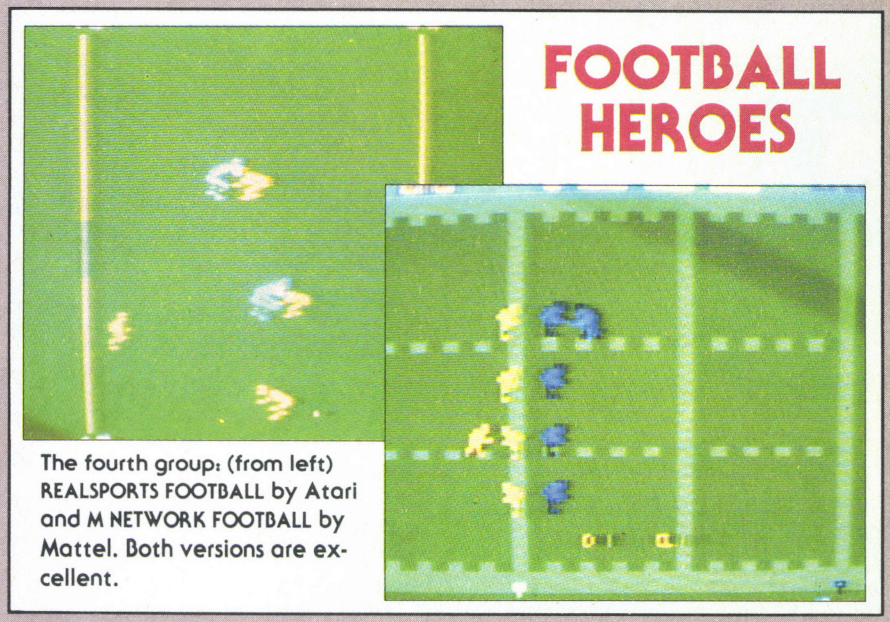
Phoenix does offer you one excellent feature not found in *Demon Attack*, namely a force field which protects you from the enemy. But be careful. After it has vanished, it can't be reactivated for another 3½ seconds.

In both games you'll meet a number of birds who possess unique talents. The monstrosities found in the third and fourth wave of *Phoenix* must be hit exactly in the middle or they regenerate back into one piece. *Demon Attack* will also make your life miserable. Instead of dying peacefully the birds sometimes split into two, giving twice as many enemies. *Phoenix* is good, but *Demon Attack* is a *must* for every owner of the VCS.

Our choice—*Demon Attack* by Imagic.

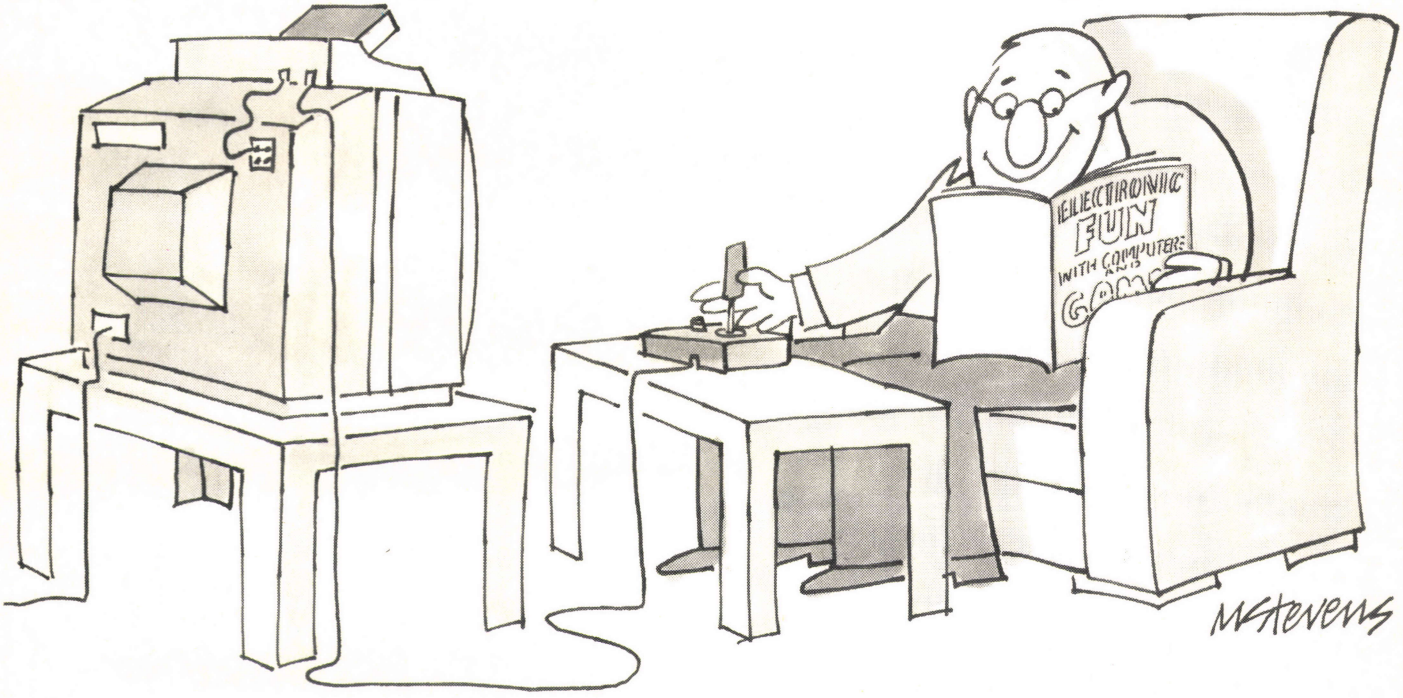
And let's not forget the new sports games. Atari now has

Continued on page 90



The fourth group: (from left) REALSPORTS FOOTBALL by Atari and M NETWORK FOOTBALL by Mattel. Both versions are excellent.

Now... a magazine about video and computer games that's as much fun to read as the games are to play!



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729101

COMPUTER WORKOUT

Yippee T-I-A!

Texas Instruments' TI 99/4A

WANTED: Personal computer system with full 16-color graphics capability and a high resolution 192-by-256 pixel display. Computer should contain a 16-bit microprocessor, and be able to address more than 64K of memory. Additional capabilities should include a built-in three-voice music synthesizer with one channel of white noise, optional voice output capability, a built-in BASIC programming language with 13-digit accuracy and a typewriter-like keyboard. Must be a popular system with a large number of games available. Computer should be able to accommodate extended BASIC, LOGO and UCSD Pascal. Price must be under $200.

By Jules H. Gilder

Does the above "want ad" sound like it's straight out of someone's computer fantasy? Two years ago it would have been. Today, however, it's not fiction—the computer that meets all of these requirements is the TI 99/4A from Texas Instruments. While the 99/4A is a great machine for video gaming because of its excellent color graphics, sound and voice capabilities, you'll

probably have a few serious criticisms of it if you've had experience on other computers. On the one hand, the 99/4A has a lot of potential. On the other hand, it's not always accessible to the user. Nevertheless, in this past year, 99/4A computers have been selling like crazy, but it wasn't always so.

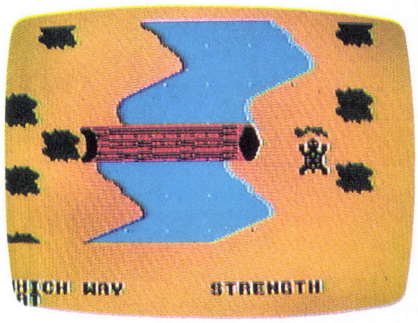
When Texas Instruments first introduced its home computer a few years ago, reaction to it was less than ecstatic. Known then simply as the TI 99/4, the unit came bundled with a color monitor and sold for over $1,200. In addition, the 99/4 had only a small keyboard with calculator-like pushbuttons.

The original 99/4 had one other very big disadvantage. If you wanted to add peripherals, you needed a table that was capable of expanding its length—the peripherals plugged into the side of the computer in a chain-like fashion. Each time you added something onto the computer, the width of the table would have to grow. Now the 99/4A has an expansion box that sits behind the computer and can hold most of the add-ons.

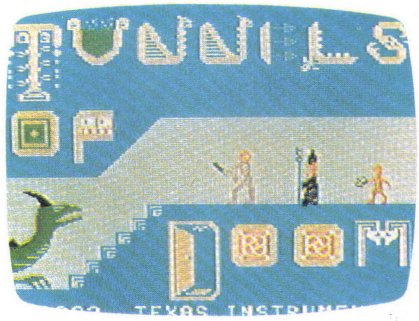
Brain Power

The microprocessor in the 99/4A is a TMS 9900, which is a 16-bit micro. This means that the micro has the ability to address a lot more memory than the more commonly used eight-bit devices. While the TI computer uses this to some advantage, it still has a lot of untapped brain power.

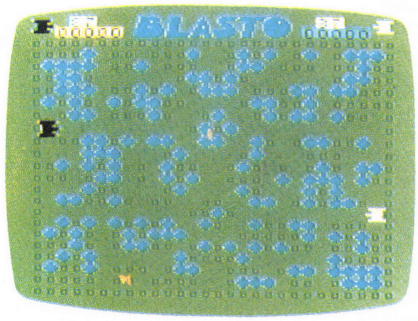
The 99/4A comes with 26K of internal ROM memory that contains the operating system and the BASIC language. The basic machine comes with 16K of RAM, but it is exapandable up to 48K. As an extra plus, the TI 99/4A can accept program cartridges, called Command Modules, that have up to 30K of additional ROM memory. With so much memory available for game designers to work with, games for the TI 99/4A can be quite sophisticated and have excellent graphics.



TERRY TURTLE'S ADVENTURE

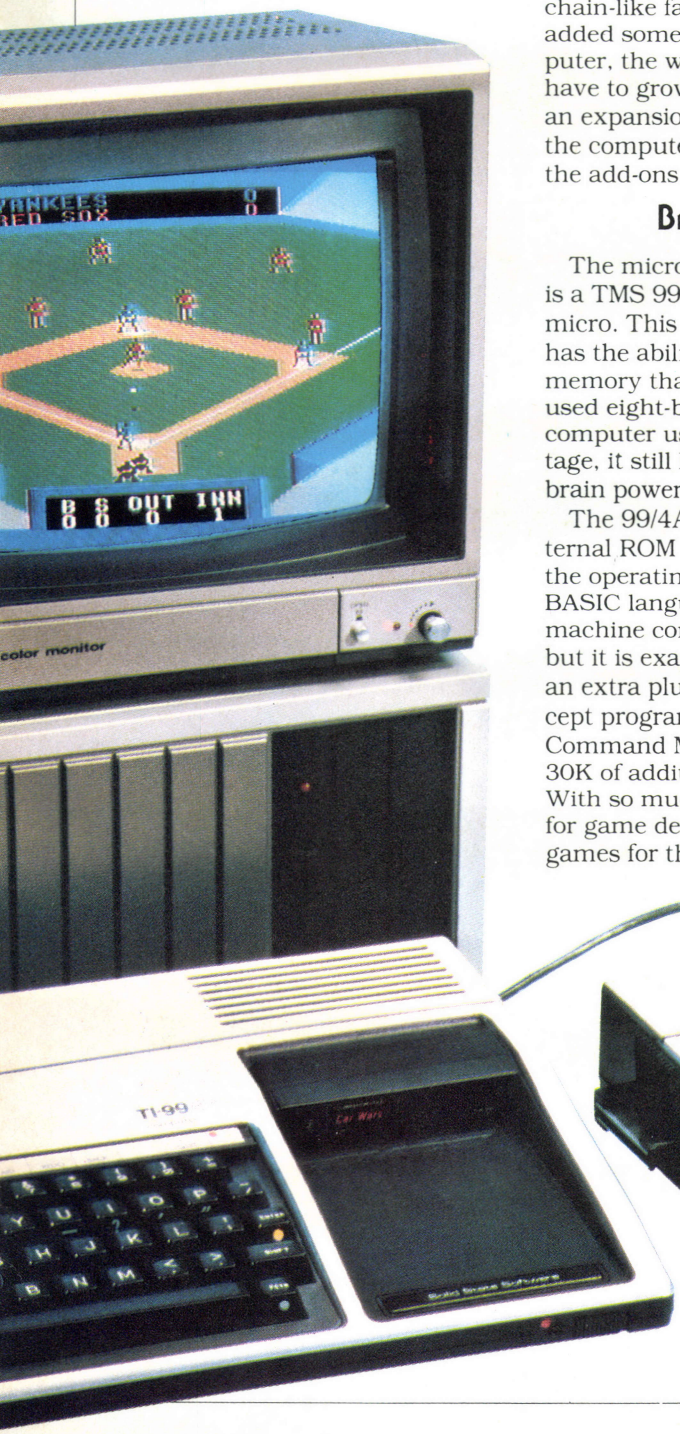


TUNNELS



BLASTO

Designers of other computer games and computers should look at the way Texas Instruments designed its cartridge system. Its primary aim is to meet the needs of the user, rather than have the user meet its needs. Most video games and computers that accept cartridges require the user to turn the game off before plugging a cartridge in or pulling it out. The on/off switch, howver, is one of the most unreliable parts of



The TI 99/4A computer has 16-color graphics capability and music and voice synthesizers.

any system; it's subject to early failure with frequent cartridge changes. The designers at TI decided that it shouldn't be necessary to force the user to turn the computer off, so they produced a system that will allow the switching of cartridges even with the power on.

Although the TI 99/4A is a programmable computer, it is really better as an educational tool and a game machine than as a computer. This is because a lot of its graphics capabilities are not accessible to the owner/programmer and are only available through programs in Command Modules. How come? One reason is that there are no plotting commands available to the user.

TI BASIC, which comes with the 99/4A, has many of the familiar BASIC commands in it, but it's missing many of the more useful ones. PEEK and POKE, for example, have been left out of TI BASIC, probably to keep programmers from wandering around the machine's internal memory thereby aiding in the protection of TI's Command Modules. Other missing commands are LEFT$,

Continued on page 93

Above, three games from TI and some of the add-ons available from Milton Bradley including the Expander.

Four new ways to get KRAZY!

CBS Software introduces four new fast-action games for your Atari 400 and 800 or Commodore VIC-20 computers.* Each one is so challenging, you'll see why K-RAZY is the name of the game!

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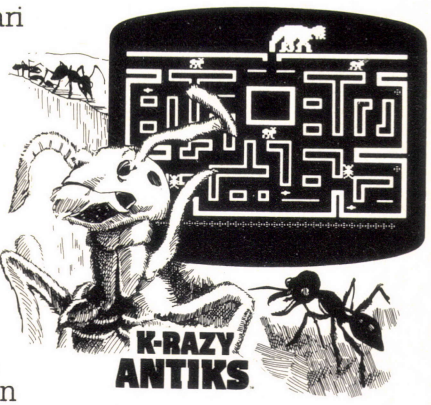

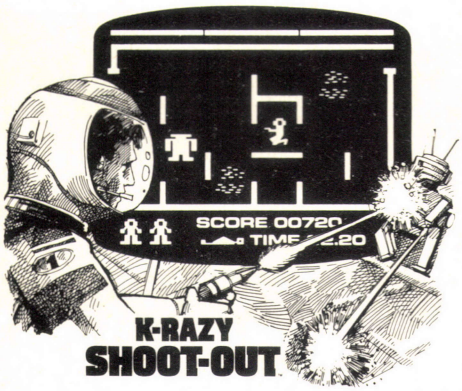

If that doesn't make you crazy, try K-RAZY SHOOT-OUT!™ If you have terrific marksmanship, you can blast through the evil Alien Droids. But only if you're really sharp will you be able to avoid the radioactive walls and escape the deadly Control Sectors.

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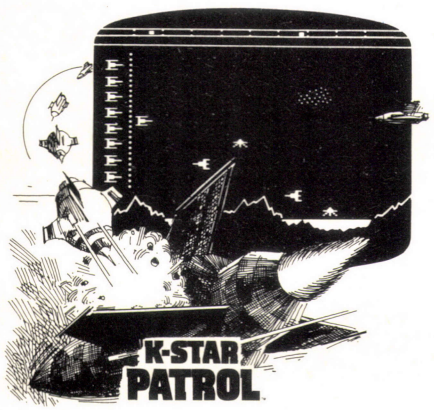

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A short course in VIC-20 computer graphics

Everyone has seen Tron *(or pictures of it) and everyone is impressed with the sensational computer graphics that were used in the movie. Wouldn't you like to make your computer generate graphics, too? We're not promising that the VIC-20 programs listed here will come close to the spectacular graphics in the movie but it's a start. After all, you have to learn to press RUN before you can RUN.*

By Martin Bass

With some very simple programs, you can make your VIC-20 come alive with bursts of color and with patterns that will flash, dance and zip around the screen. The best way to learn is by doing, so let's do.

Let's say you're giving a surprise birthday party and you want to have the message "HAPPY BIRTHDAY" flashing on the television screen. Turn on your VIC and type in the following program.

```
10 PRINT "HAPPY BIRTHDAY"
20 PRINT " ♥ "
30 GOTO 10
```

To get the inverse heart symbol in line 20, you have to hold down the shift key and the CLR key *at the same time*. This symbol represents the instruction "clear the screen."

Now RUN the program. If you typed it in correctly, you should see the message "HAPPY BIRTHDAY" flickering in the upper left hand corner of your screen.

Flicker And Flash

This is nice but there are two things that could be improved in this program. First, we'd like the message to flash on and off like a neon sign, and right now, it's just flickering. Second, we'd like the message displayed in the center of the screen. By the way, you're not under any obligation to use the words "Happy Birthday." You may certainly substitute any word or phrase you like better.

But before we fix the program, let's make sure we understand how it works. When you give the command RUN, your VIC examines the program you've typed in to find the line with the lowest line number. It performs the instructions on that line and then goes to the line with the next higher number. In our program, line 10 prints the message, line 20 erases it, and line 30 loops back to line 10 so that the whole process can begin over again. When you tell the program to RUN, it goes into an endless loop of print/erase.

Illustration: Bob Winterson

print/erase, print/erase and so on. One thing about computers, they never get bored doing repetitious tasks.

The problem is that all of this is happening so fast that it's a blur to our eyes. Instead of seeing a smooth, even flash, we just see a flicker when we want more of a flashing on and off effect. The solution is to slow down the program by inserting one or two time delay loops. Add these lines to your program and then RUN it.

```
15  FOR T = 1 TO 500: NEXT
25  FOR T = 1 TO 500: NEXT
```

If you'd like the message to flash even slower, try

```
15  FOR T = 1 TO 1000: NEXT
25  FOR T = 1 TO 1000: NEXT
```

A time delay loop is very easy to understand. Take line 15 for example. When the computer reaches this line, it counts from one to 500 and then goes on to the next line of the program. This counting takes a fraction of a second and that puts a slight delay into the program. When you change the line so that the computer has to count from one to 1000, you get a longer delay.

To center "HAPPY BIRTHDAY", you have to know that from the left edge of the screen to the right edge, VIC has space for 22 characters. "HAPPY BIRTHDAY" takes up 14 spaces. Some simple arithmetic shows that we need margins of four spaces. (Twenty-two minus fourteen is eight. Eight divided by two is four.) So add this line to your program.

```
9  PRINT TAB(4)
```

and change line 30 to

```
30  GOTO 9
```

The only remaining problem is that "HAPPY BIRTHDAY" is still at the top of the screen. We've centered it horizontally but not vertically. Add this line to your program:

```
8  PRINT
```

and change line 30 to

```
30  GOTO 8
```

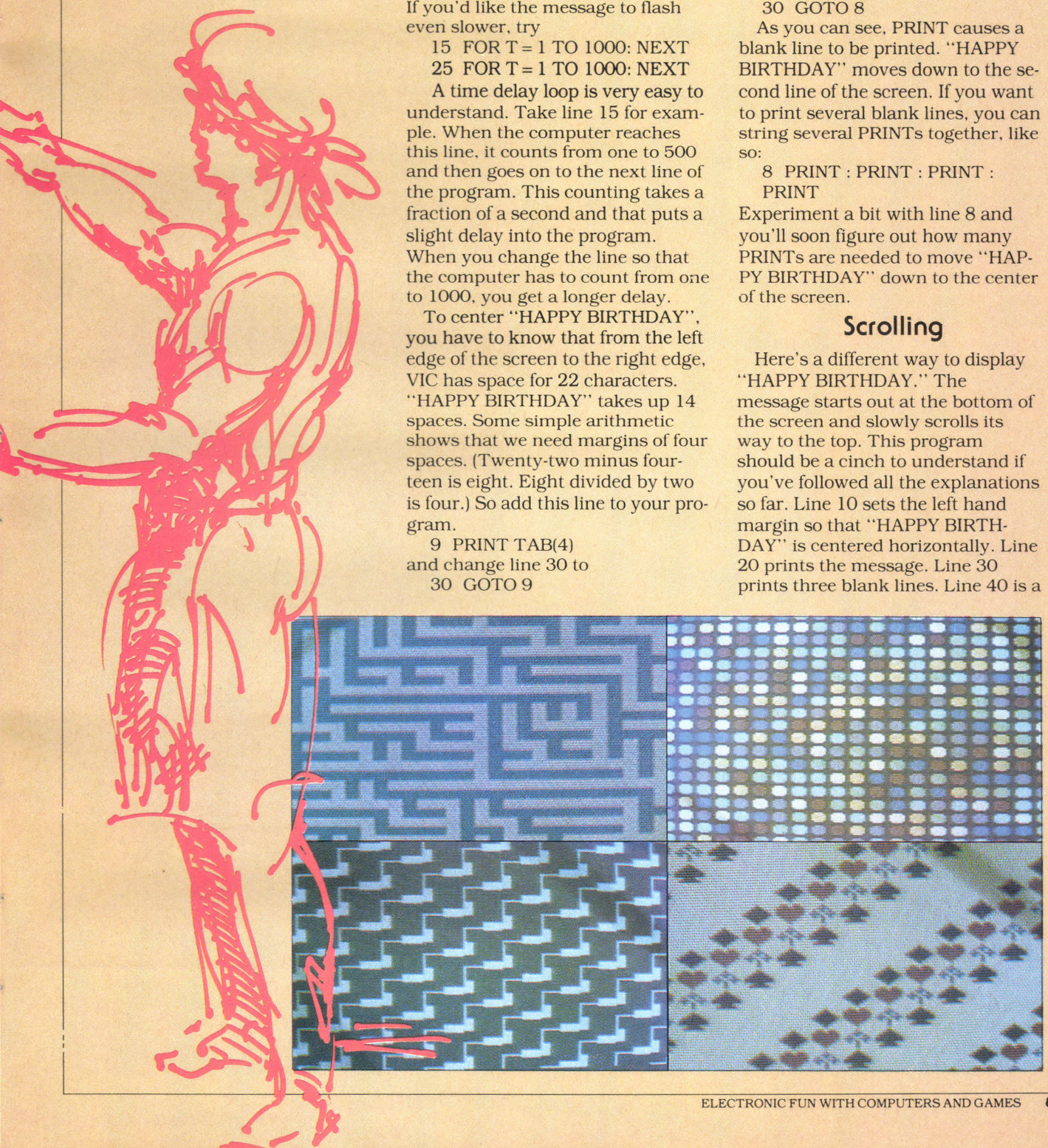
As you can see, PRINT causes a blank line to be printed. "HAPPY BIRTHDAY" moves down to the second line of the screen. If you want to print several blank lines, you can string several PRINTs together, like so:

```
8  PRINT : PRINT : PRINT :
   PRINT
```

Experiment a bit with line 8 and you'll soon figure out how many PRINTs are needed to move "HAPPY BIRTHDAY" down to the center of the screen.

Scrolling

Here's a different way to display "HAPPY BIRTHDAY." The message starts out at the bottom of the screen and slowly scrolls its way to the top. This program should be a cinch to understand if you've followed all the explanations so far. Line 10 sets the left hand margin so that "HAPPY BIRTHDAY" is centered horizontally. Line 20 prints the message. Line 30 prints three blank lines. Line 40 is a



time delay loop that slows down the program. And line 50 sets up a loop so that the program will run continuously.

```
10 PRINT TAB(4)
20 PRINT "HAPPY BIRTHDAY"
30 PRINT : PRINT : PRINT
40 FOR T = 1 TO 500: NEXT T
50 GOTO 10
```

Now let's make the program more personal. We'll have it say "HAPPY BIRTHDAY BILL." Add these lines:

```
24 PRINT TAB(9)
26 PRINT "BILL"
```

Then type RUN and see what happens.

Graphic Characters

Now that we've learned two different techniques for displaying messages, we're ready to move on to color and pattern. The simplest way to put patterns on the screen is by using the VIC's graphic characters. Notice the ball on the right side of "Q" key. If you hold down the shift key and press the "Q" key *at the same time*, a ball will appear on the screen. Try it. Now RUN this simple program using the ball. In line 10, make sure you leave a space on each side of the ball.

```
10 PRINT " ● ";
20 FOR T = 1 TO 50: NEXT T
30 GOTO 10
```

Let's experiment with other right-side graphics characters. Hold down the shift key and the "M" key and you'll get a backwards slash. Now hold down the shift key and the "N" key. You get a forwards slash. The two characters together make a giant "V". Now RUN this simple program using the two slashes. In line 10, after the first quotation mark, put *four spaces* before you type the graphic characters.

```
10 PRINT "    \/ "; [SHIFT-M
   SHIFT-N]
20 FOR T = 1 TO 50: NEXT T
30 GOTO 10
```

Now, to see how important spaces are, change line 10 so that there are five spaces before the graphic characters. RUN the program.

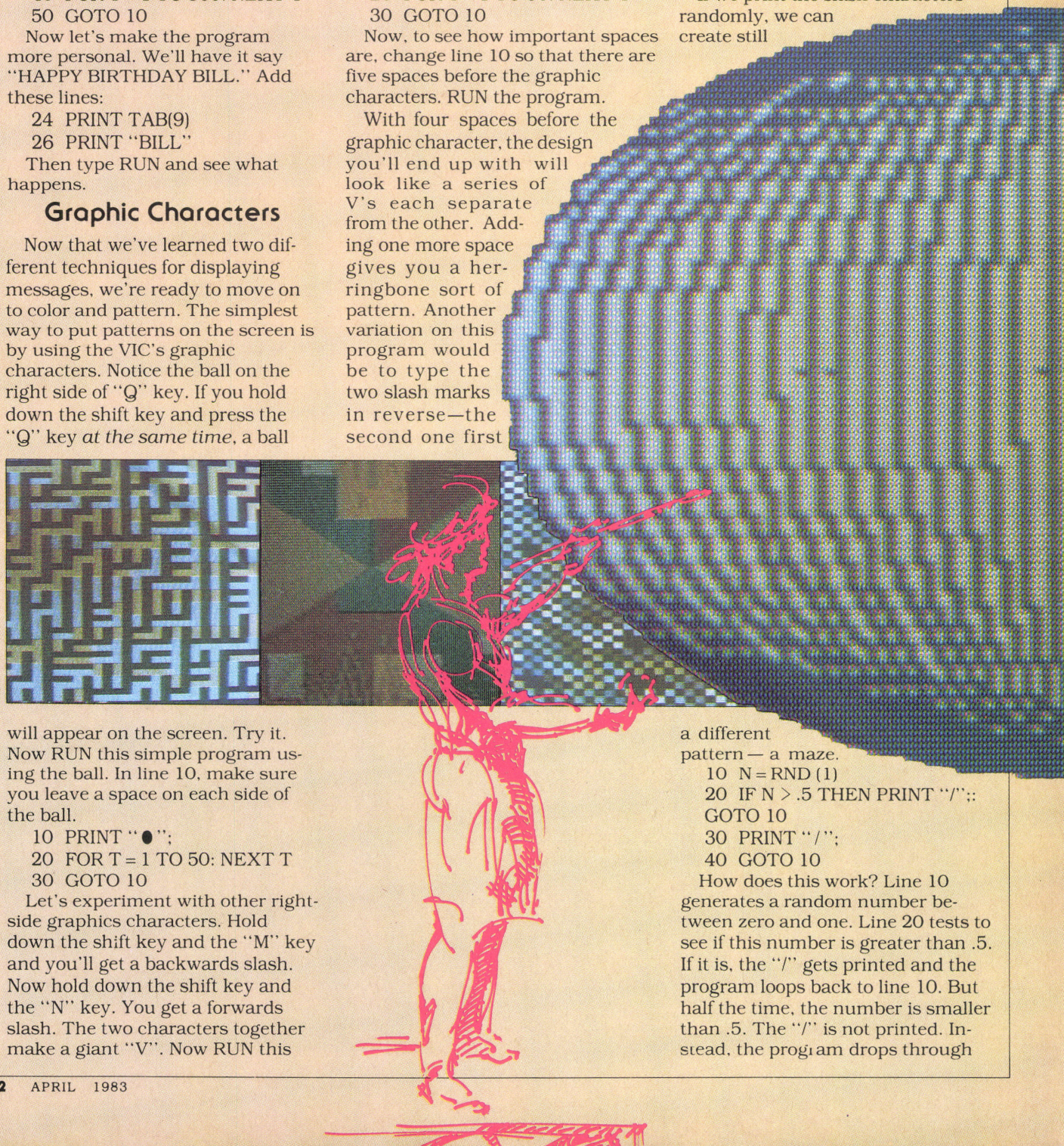
With four spaces before the graphic character, the design you'll end up with will look like a series of V's each separate from the other. Adding one more space gives you a herringbone sort of pattern. Another variation on this program would be to type the two slash marks in reverse—the second one first and the first one second. This will result in a pattern that looks like a bunch of tents. Try your own variations using different characters and varying the number of spaces.

Blue Maze

If we print the slash characters randomly, we can create still a different pattern — a maze.

```
10 N = RND (1)
20 IF N > .5 THEN PRINT "/";:
   GOTO 10
30 PRINT "/";
40 GOTO 10
```

How does this work? Line 10 generates a random number between zero and one. Line 20 tests to see if this number is greater than .5. If it is, the "/" gets printed and the program loops back to line 10. But half the time, the number is smaller than .5. The "/" is not printed. Instead, the program drops through



to line 30, which causes a " " to be printed. Because of the .5 in line 20, the two slashes have an equal likelihood of being printed. But it's easy enough to change the odds. Just substitute another decimal like .9. Now the odds aren't 50-50. They're 90-10 and the pattern will change.

The punctuation marks are important. Make sure all semi-colons and colons appear on your screen exactly as shown in the program.

A Deck Of Cards

So far, all our programs have had the identical color scheme. The screen is white, the border is light blue, and the graphic characters are dark blue. Let's make some changes. On the upper left hand side of the VIC keyboard, you'll find a CONTROL key. This key, when used with any of the COLOR keys on the top row of the keyboard, will change the color of graphic characters.

Hold down the CONTROL key and press the RED key. The cursor should change to red. Now hold down the SHIFT key and press the "S" key. You should have a red heart on the screen. Find the other card suits—the spade, the diamond and the club. They're the right side graphic characters on the "A," "Z," and "X" keys. Try making a black diamond, a black spade, and a blue club.

Now let's use the card suits in a program. There's one slight complication here. When you type color control keys after a quotation mark, you get odd inverse characters on the screen. For instance, the character representing BLUE looks like a backwards arrow. These inverse characters are just VIC's way of keeping track of colors. They won't be printed out when you RUN your program.

Since this can be confusing, here's the exact sequence to follow when typing out line 20 below: PRINT space QUOTATION MARKS three spaces CONTROL BLACK SHIFT Z CONTROL RED SHIFT S CONTROL BLUE SHIFT X CONTROL BLACK SHIFT A QUOTATION MARK SEMICOLON.

```
10 REM COLORED CARD SUITS
20 PRINT "   ♠ ♥ ♣ ♦ ";
30 FOR T = 1 TO 50: NEXT T
40 GOTO 20
```

There's one new keyword here, REM. REM stands for remark. REM statements are ignored by the computer. They're for the benefit of the person using the program. In this case, the REM statement serves as a title. It tells us what the program is about. As a general rule, the more REM statements in a program the better. Not only can they serve as titles, but they can also help you remember what a particular line does. In effect, a REM statement is a little note to yourself.

Poking Around

Now let's change the screen and border colors. Type this into your VIC.

```
POKE 36879,9
```

To return the screen to the way it was before, type this.

```
POKE 36879, 27
```

POKE is a way of changing the contents of a memory location inside the VIC. It happens that location 36879 controls the color of the screen and border. Think of it as a switch. When you want a black screen with a white border, you have to set this switch to the number 9, so you type POKE 36879,9. On page 134 of your VIC guide, you'll find a chart with the numbers that you can POKE into 36879 and the color combinations they'll produce.

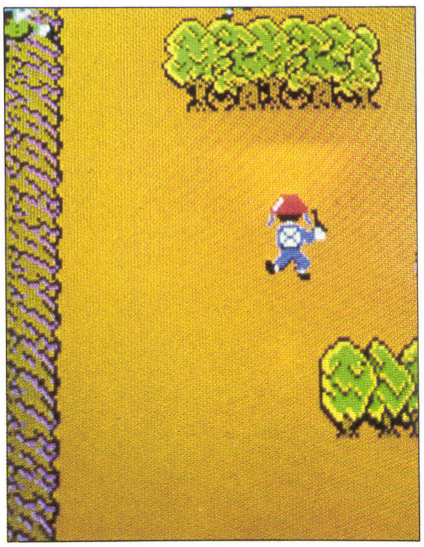
Continued on page 90

Screen plays

Toeing the Front Line

By Michael Blanchet

Taito has long been a purveyor of original and offbeat games. Their latest, *Front Line*, could very well be the sleeper hit of the year. In *Front Line*, you are a lone infantryman. With pistol in hand and a sack of grenades, you must maneuver through fields and rocky



You're in the army now . . .

wastelands, avoiding troops and tanks. The object of the game is to capture the enemy fortress.

To pilot your G.I. along the vertically scrolling playfield, an eight-position joystick is used. The soldier's pistol is aimed and fired with an eight-position encoder wheel, similar to the one used on Taito's *Wild Western* coin-op. This device only allows the player to fire from positions corresponding with the eight major compass points (north, south, east and west and points midway between). Instead of the unrestrained action of a knob (such as the one used in *Tron* or *Tempest*), *Front Line*'s controller clicks into position. To fire, push down on the knob. For every maneuver, I recommend taking a firm grip on the controller.

The Grenade button rests to the far right of the control panel. When pressed, one grenade is thrown in the direction the infantryman's arm is pointing. Grenades fly and fall in an "L" shaped trajectory.

It is not necessary to score a direct hit on an enemy tank or soldier to kill them. If the bomb detonates in the proximity of the target, the aftershock will knock out the enemy troop or tank.

What makes *Front Line* so enthralling is the variety of situations you encounter during the game, each of which calls for a different course of action. The following tips should help you overcome the obstacles you'll encounter along the way.

Avoid the small squares that are scattered along the playfield. These are land mines. They can, however, be put to good use. If a group of enemy soldiers is congregating around a mine, shoot at the charge. A well-placed shot will set off the bomb, killing every troop in the immediate vicinity. Mines leave large craters which should be avoided.

Keep moving at all times. By running and firing simultaneously, you will fan out your shots, increasing your chances of scoring a hit.

Try to kill every enemy troop as you confront it, as opposed to running from it. Every troop passed up will chase you and eventually catch up with you later in the game. A good rule of thumb is to kill as you go along.

You'll need to use grenades against the snipers that are perched atop trees. To bring them down, lob a grenade at the base of the tree.

After negotiating the long vertical strip, you'll enter a large wasteland covered by dirt roads, grassy fields and boulders. Here you'll face whatever troops are chasing you plus two types of green enemy tanks. Guns are of no use against tanks, so you must rely on grenades. For greater mobility and firepower, climb aboard one of the blue tanks parked at various points on the playfield. To board a blue tank, move up to it as close as possible then push the grenade button. Your

foot soldier will become a tank commander.

When inside a tank, the controls operate in a manner similar to when the soldier is on foot. The knob rotates the gun turret and launches the projectiles. The tank itself is steered with the joystick. When the tank is hit by enemy fire, it is imperative that you climb out

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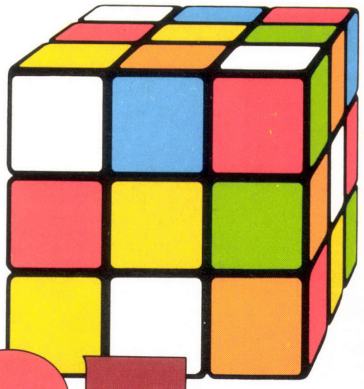
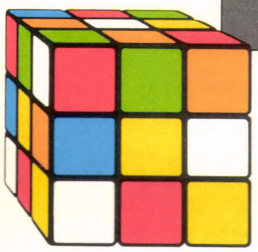


FIRST SCREENING: THE CUBE



We're waiting to discover you.

Send us a program that you've written and maybe we'll send you $100. Each month in First Screening, *we print a program that one of our readers has written. If you think you have hidden talent as a designer and you have a program that you think deserves recognition, send it to us. Be sure to let us know which computer it's for and to include a complete computer printout. For more information on how to enter,* *see page 90.*

*This month's winner is Mark Pickenheim. Mark is 12 years old but wrote his program —*The Cube*—when he was 11. The amazing part is that he wrote it without even owning a computer. He used someone else's.*

The Game

The Cube was written for the TRS-80 Model III and requires at least 16K of memory. Because the listing is so long, it won't work on a 4K or level 1 computer.

How To Play

The game is based on the Rubik's Cube concept. The computer draws a cube on the screen and you must make all the little squares on one side match. Three sides of the cube are seen although only one side faces you directly. Although the squares are not in color, each one contains a letter and the letters on any one side of the cube must all match in order to win.

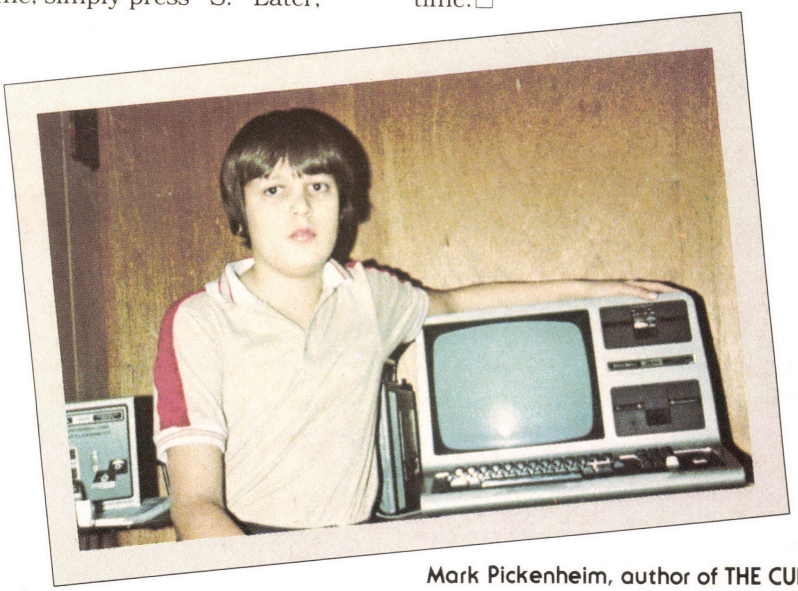
If you want, the computer will scramble the cube for you. All you need to do is press "A."

In order to rotate the cube so that the side you're working on is facing you, press any key from 1 through 9 and the side next to or below the one facing you will move toward whatever number you've chosen.

There are a few other commands you ought to know: Pressing "R" will reset the cube. Pressing "I" will call up the instructions and pressing "S" will either save or load the game. The "S" command is particularly useful. If you have to go somewhere in the middle of the game, simply press "S." Later, when you're ready to resume play, load the program and press "S" again.

Strategy

What I do is solve the top and bottom and then the middle. There's only one skill level but it's difficult enough to challenge you for a long time. □



Mark Pickenheim, author of THE CUBE.

```
100 CLEAR500:L5=457
110 ZZ$=CHR$(140)+CHR$(191)+" ":ZY$=STRING$(2,179)+CHR$(191):ZX$=ZY$:ZW$=CHR$(19
1)+CHR$(176)+CHR$(191):ZV$=CHR$(191)+STRING$(2,179):ZU$=CHR$(191)+STRING$(2,179)
120 YZ$=CHR$(140)+CHR$(143)+CHR$(140):YY$=CHR$(143)+STRING$(2,140):YX$=STRING$(2
,140)+CHR$(143):YW$="  "+CHR$(143):YV$=YX$:YU$=CHR$(143)+CHR$(140)+CHR$(143)
130 AA$=CHR$(131)+CHR$(191)+CHR$(131)+"  "+CHR$(191)+CHR$(176)+CHR$(191)+"  "+CHR$
(191)+CHR$(179)+CHR$(131)+"  "+CHR$(188)+STRING$(2,131)+"  "+CHR$(191)+CHR$(179)+CHR$(131)
91)+"  "+CHR$(191)+CHR$(179)+CHR$(140)+"  "+CHR$(191)+CHR$(179)+CHR$(179)+CHR$(191)+"  "+CHR$(1
140 BB$="  "+CHR$(143)+"  "+CHR$(143)+"  "+CHR$(143)+"  "+CHR$(131)+CHR$(140)+CHR$(131)+"  "+CHR$(143)+CH
"  "+CHR$(131)+STRING$(2,140)+"  "+CHR$(143)+STRING$(2,140)
R$(140)+CHR$(131)+"  "+CHR$(143)+STRING$(2,140)
150 ZT$=STRING$(2,131)+CHR$(191):ZS$=CHR$(191)+CHR$(179)+CHR$(191):ZR$=ZS$:ZQ$=C
HR$(131)+CHR$(191)+CHR$(131):ZP$=CHR$(191)+CHR$(179)+CHR$(140)
160 YT$="  "+CHR$(143):YS$=CHR$(143)+CHR$(140)+CHR$(143):YR$=STRING$(2,140)+CHR$
(143):YQ$=CHR$(140)+CHR$(143)+CHR$(140):YP$=CHR$(143)+CHR$(128)+CHR$(143)
170 QQ$=CHR$(188)+CHR$(131)+CHR$(188):WW$=CHR$(143)+CHR$(131)+CHR$(143):FF$=CHR$
(188)+CHR$(179)+CHR$(179)+"  ":FG$=STRING$(2,140)+CHR$(131)
180 '
190 '   Programed by Mark Pickenheim     Copyright 1982
200 '               RD#3 Box 244B
210 '               Moscow, Pa.18444
220 '
230 GOTO2410
240 CLS:Z=15360
250 PRINT@111,"7     8     9";
260 PRINT@231,"6";:PRINT@353,"5";
270 PRINT@475,"4";:PRINT@600,"3";
280 PRINT@728,"2";:PRINT@856,"1";
290 PRINT@0,AA$;:PRINT@64,BB$;
300 GOTO340
310 PRINT@0,"R=RED       G=GREEN     B=BLUE";
320 PRINT@64,"Y=YELLOW    O=ORANGE    W=WHITE";
330 RETURN
340 FORA=0TO59:SET(A,6):NEXT
350 FORA=0TO6:SET(59,A):NEXT
360 FORA=52TO89:SET(A,25):SET(A,31)
370 SET(A,37):SET(A,43):SET(A+12,19):SET(A+24,13)
380 SET(A+36,7):NEXT:FORA=25TO43
390 SET(52,A):SET(53,A):SET(64,A):SET(65,A)
400 SET(76,A):SET(77,A):SET(88,A):SET(89,A)
410 SET(100,A-6):SET(101,A-6):SET(112,A-12):SET(113,A-12)
420 SET(124,A-18):SET(125,A-18):NEXT
430 B=54:C=24:D=66:E=C:F=78:G=E:H=90:I=G
440 J=90:K=30:L=J:M=36:N=90:O=42
450 FORA=1TO18
460 SET(B,C):B=B+1:SET(B,C):B=B+1:C=C-1
470 SET(D,E):D=D+1:SET(D,E):D=D+1:E=E-1
480 SET(F,G):F=F+1:SET(F,G):F=F+1:G=G-1
490 SET(H,I):H=H+1:SET(H,I):H=H+1:I=I-1
500 SET(J,K):J=J+1:SET(J,K):J=J+1:K=K-1
510 SET(L,M):L=L+1:SET(L,M):L=L+1:M=M-1
520 SET(N,O):N=N+1:SET(N,O):N=N+1:O=O-1:NEXT
530 FORX=1TO3:FORY=1TO3
540 A(X,Y)=ASC("W"):B(X,Y)=ASC("B"):C(X,Y)=ASC("Y")
550 D(X,Y)=ASC("G"):E(X,Y)=ASC("O"):F(X,Y)=ASC("R"):NEXT:NEXT
560 FORB=1TO9:READA:POKEA+Z,E(1,1):NEXTB
570 FORB=1TO9:READA:POKEA+Z,A(1,2):NEXT
580 FORB=1TO9:READA:POKEA+Z,B(1,1):NEXT
590 PRINT@448,"Command?";
600 PRINT@448+128,"I for Instructions";
610 PRINT@447+192," S to save or load game";
620 A$=INKEY$
630 IFA$=""THEN620
640 IFA$="I"THENGOSUB2200
650 IFA$="R"THEN2300
660 IFA$="A"THEN2590
670 IFA$="S"THENPRINT@L5,FF$;:PRINT@L5+64,FG$;:GOTO1730
680 A=ASC(A$)-48:IFA=<0THEN590
690 IFA=>10THEN590
700 ONAGOSUB2320,2330,2340,2350,2360,2370,2380,2390,2400
710 ONAGOSUB730,840,920,1060,1190,1260,1370,1490,1560
720 GOTO590
730 AA=A(3,1):BB=A(3,2):CC=A(3,3)
740 A(3,1)=B(3,1):A(3,2)=B(3,2):A(3,3)=B(3,3)
750 B(3,1)=C(3,1):B(3,2)=C(3,2):B(3,3)=C(3,3)
760 C(3,1)=D(3,1):C(3,2)=D(3,2):C(3,3)=D(3,3)
770 D(3,1)=AA:D(3,2)=BB:D(3,3)=CC
780 A=F(1,1):B=F(1,2):C=F(1,3):D=F(2,1):E=F(2,3):FF=F(3,1)
790 G=F(3,2):H=F(3,3):F(1,1)=C:F(1,2)=E:F(1,3)=H:F(2,1)=B
800 F(2,3)=G:F(3,1)=A:F(3,2)=D:F(3,3)=FF
810 POKE861+Z,A(3,1):POKE867+Z,A(3,2):POKE873+Z,A(3,3)
820 POKE815+Z,B(3,1):POKE693+Z,B(3,2):POKE571+Z,B(3,3)
830 RETURN
840 AA=A(2,1):BB=A(2,2):CC=A(2,3)
850 A(2,1)=B(2,1):A(2,2)=B(2,2):A(2,3)=B(2,3)
860 B(2,1)=C(2,1):B(2,2)=C(2,2):B(2,3)=C(2,3)
870 C(2,1)=D(2,1):C(2,2)=D(2,2):C(2,3)=D(2,3)
880 D(2,1)=AA:D(2,2)=BB:D(2,3)=CC
890 POKE733+Z,A(2,1):POKE739+Z,A(2,2):POKE745+Z,A(2,3)
900 POKE687+Z,B(2,1):POKE565+Z,B(2,2):POKE443+Z,B(2,3)
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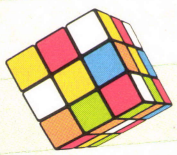

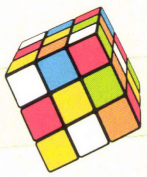

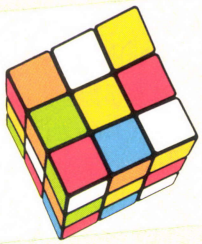

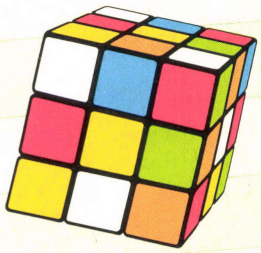

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880 D(2,1)=AA:D(2,2)=BB:D(2,3)=CC
890 POKE733+Z,A(2,1):POKE739+Z,A(2,2):POKE443+Z,B(2,3)
900 POKE687+Z,B(2,1):POKE565+Z,B(2,2):POKE443+Z,B(2,3)
910 RETURN
920 AA=A(1,1):BB=A(1,2):CC=A(1,3)
930 A(1,1)=B(1,1):A(1,2)=B(1,2):A(1,3)=B(1,3)
940 B(1,1)=C(1,1):B(1,2)=C(1,2):B(1,3)=C(1,3)
950 C(1,1)=D(1,1):C(1,2)=D(1,2):C(1,3)=D(1,3)
960 D(1,1)=AA:D(1,2)=BB:D(1,3)=CC
970 A=E(1,1):B=E(1,2):C=E(1,3):D=E(2,1):E=E(2,3):F=E(3,1)
980 G=E(3,2):H=E(3,3):E(1,1)=F:E(1,2)=D:E(1,3)=A:E(2,1)=G
990 E(2,3)=B:E(3,1)=H:E(3,2)=E:E(3,3)=C
1000 POKE605+Z,A(1,1):POKE611+Z,A(1,2):POKE617+Z,A(1,3):POKE559+Z,B(1,1)
1010 POKE437+Z,B(1,2):POKE315+Z,B(1,3)
1020 POKE236+Z,E(1,1):POKE242+Z,E(1,2):POKE248+Z,E(1,3)
1030 POKE358+Z,E(2,1):POKE370+Z,E(2,3):POKE480+Z,E(3,1)
1040 POKE486+Z,E(3,2):POKE492+Z,E(3,3)
1050 RETURN
1060 AA=E(3,1):BB=E(3,2):CC=E(3,3)
1070 E(3,1)=B(1,1):E(3,2)=B(2,1):E(3,3)=B(3,1)
1080 B(1,1)=F(1,3):B(2,1)=F(1,2):B(3,1)=F(1,1)
1090 F(1,1)=D(1,3):F(1,2)=D(2,3):F(1,3)=D(3,3)
1100 D(1,3)=CC:D(2,3)=BB:D(3,3)=AA
1110 A=A(1,1):B=A(1,2):C=A(1,3):D=A(2,1):E=A(2,3):F=A(3,1)
1120 G=A(3,2):H=A(3,3):A(1,1)=C:A(1,2)=E:A(1,3)=H:A(2,1)=B
1130 A(2,3)=G:A(3,1)=A:A(3,2)=D:A(3,3)=F:POKE480+Z,E(3,1)
1140 POKE486+Z,E(3,2):POKE492+Z,E(3,3):POKE559+Z,B(1,1)
1150 POKE687+Z,B(2,1):POKE815+Z,B(3,1):POKE605+Z,A(1,1)
1160 POKE611+Z,A(1,2):POKE617+Z,A(1,3):POKE733+Z,A(2,1)
1170 POKE745+Z,A(2,3):POKE861+Z,A(3,1):POKE867+Z,A(3,2)
1180 POKE873+Z,A(3,3):RETURN
1190 A=E(2,1):B=E(2,2):C=E(2,3)
1200 E(2,1)=B(1,2):E(2,2)=B(2,2):E(2,3)=B(3,2):B(1,2)=F(2,3)
1210 B(2,2)=F(2,2):B(3,2)=F(2,1):F(2,1)=D(1,2):F(2,2)=D(2,2)
1220 F(2,3)=D(3,2):D(1,2)=C:D(2,2)=B:D(3,2)=A
1230 POKE358+Z,E(2,1):POKE364+Z,E(2,2):POKE370+Z,E(2,3)
1240 POKE437+Z,B(1,2):POKE565+Z,B(2,2):POKE693+Z,B(3,2)
1250 RETURN
1260 AA=E(1,1):BB=E(1,2):CC=E(1,3)
1270 E(1,1)=B(1,3):E(1,2)=B(2,3):E(1,3)=B(3,3)
1280 B(1,3)=F(3,3):B(2,3)=F(3,2):B(3,3)=F(3,1)
1290 F(3,1)=D(1,1):F(3,2)=D(2,1):F(3,3)=D(3,1)
1300 D(1,1)=CC:D(2,1)=BB:D(3,1)=AA:POKE236+Z,E(1,1)
1310 POKE242+Z,E(1,2):POKE248+Z,E(1,3):POKE315+Z,B(1,3)
1320 POKE443+Z,B(2,3):POKE571+Z,B(3,3)
1330 A=C(1,1):B=C(1,2):CC=C(1,3):D=C(2,1):E=C(2,3)
1340 F=C(3,1):G=C(3,2):H=C(3,3):C(1,1)=F:C(1,2)=D:C(1,3)=A
1350 C(2,1)=G:C(2,3)=B:C(3,1)=H:C(3,2)=E:C(3,3)=CC
1360 RETURN
1370 A=A(1,1):B=A(2,1):C=A(3,1)
1380 A(1,1)=F(1,1):A(2,1)=F(2,1):A(3,1)=F(3,1)
1390 F(1,1)=C(3,3):F(2,1)=C(2,3):F(3,1)=C(1,3)
1400 C(3,3)=E(1,1):C(2,3)=E(2,1):C(1,3)=E(3,1)
1410 E(1,1)=A:E(2,1)=B:E(3,1)=C
1420 POKE236+Z,E(1,1):POKE358+Z,E(2,1)
1430 POKE480+Z,E(3,1):POKE605+Z,A(1,1):POKE733+Z,A(2,1)
1440 POKE861+Z,A(3,1)
1450 A=D(1,1):B=D(1,2):C=D(1,3):D=D(2,1):E=D(2,3):F=D(3,1)
1460 G=D(3,2):H=D(3,3):D(1,1)=C:D(1,2)=E:D(1,3)=H:D(2,1)=B
1470 D(2,3)=G:D(3,1)=A:D(3,2)=D:D(3,3)=F
1480 RETURN
1490 A=A(1,2):B=A(2,2):C=A(3,2)
1500 A(1,2)=F(1,2):A(2,2)=F(2,2):A(3,2)=F(3,2)
1510 F(1,2)=C(3,2):F(2,2)=C(2,2):F(3,2)=C(1,2)
1520 C(1,2)=E(3,2):C(2,2)=E(2,2):C(3,2)=E(1,2)
1530 E(1,2)=A:E(2,2)=B:E(3,2)=C:POKE242+Z,E(1,2)
1540 POKE364+Z,E(2,2):POKE486+Z,E(3,2):POKE611+Z,A(1,2)
1550 POKE739+Z,A(2,2):POKE867+Z,A(3,2):RETURN
1560 A=A(1,3):B=A(2,3):C=A(3,3)
1570 A(1,3)=F(1,3):A(2,3)=F(2,3):A(3,3)=F(3,3)
1580 F(1,3)=C(3,1):F(2,3)=C(2,1):F(3,3)=C(1,1)
1590 C(1,1)=E(3,3):C(2,1)=E(2,3):C(3,1)=E(1,3)
1600 E(1,3)=A:E(2,3)=B:E(3,3)=C
1610 POKE248+Z,E(1,3):POKE370+Z,E(2,3):POKE492+Z,E(3,3)
1620 POKE617+Z,A(1,3):POKE745+Z,A(2,3):POKE873+Z,A(3,3)
1630 A=B(1,1):B=B(1,2):C=B(1,3):D=B(2,1):E=B(2,3):F=B(3,1)
1640 G=B(3,2):H=B(3,3):B(1,1)=F:B(1,2)=D:B(1,3)=A:B(2,1)=G
1650 B(2,3)=B:B(3,1)=H:B(3,2)=E:B(3,3)=C:POKE559+Z,B(1,1)
1660 POKE437+Z,B(1,2):POKE315+Z,B(1,3):POKE687+Z,B(2,1)
1670 POKE443+Z,B(2,3):POKE815+Z,B(3,1):POKE693+Z,B(3,2)
1680 POKE571+Z,B(3,3)
1690 RETURN
1700 DATA236,242,248,358,364,370,480,486,492
1710 DATA605,611,617,733,739,745,861,867,873
1720 DATA559,437,315,687,565,443,815,693,571
1730 PRINT@832,"(L)oad or (S)ave Game?";:A$=INKEY$:IFA$=""THEN1730
1740 IFA$="L"ORA$="l"THEN1770
1750 IFA$="S"ORA$="s"THEN1910
1760 GOTO1730
1770 PRINT@832,"(D)isk or (C)assette? ";:A$=INKEY$:IFA$=""THEN1770
1780 IFA$="D"ORA$="d"THENPRINT@832,"Prepare Disk, PRESS /";:GOSUB2160:GOTO1810
1790 IFA$="C"ORA$="c"THENPRINT@832,"Prepare Cass, PRESS /";:GOSUB2160:GOTO1860
1800 PRINT@832,"                              ";:GOTO1770
1810 ONERRORGOTO2190:OPEN"I",1,"GAME/DAT"
1820 FORX=1TO3:FORY=1TO3                    D(X,Y),E(X,Y),F(X,Y)
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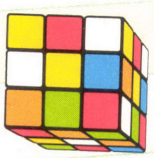
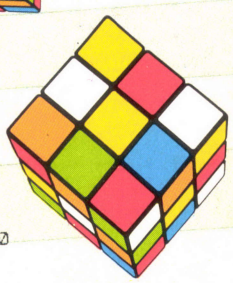
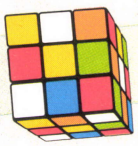
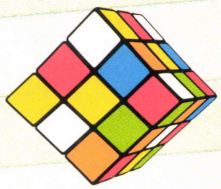
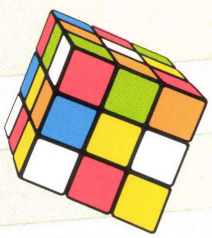




```
1770 PRINT@832,"(D)isk or
1780 IFA$="D"ORA$="d"THENPRINT@832,"Prepare
1790 IFA$="C"ORA$="c"THENPRINT@832,"Prepare Cass, PRESS /";:GOSUB2160
1800 PRINT@832,"                    ";:GOTO1770
1810 ONERRORGOTO2190:OPEN"I",1,"GAME/DAT"
1820 FORX=1TO3:FORY=1TO3
1830 INPUT#1,A(X,Y),B(X,Y),C(X,Y),D(X,Y),E(X,Y),F(X,Y)
1840 NEXT:NEXT:CLOSE                    ";:GOTO2060
1850 PRINT@832,"                        ";
1860 PRINT@832,"One moment, please      ";
1870 FORX=1TO3:FORY=1TO3
1880 INPUT#-1,A(X,Y),B(X,Y),C(X,Y),D(X,Y),E(X,Y),F(X,Y)
1890 NEXT:NEXT                          ";:GOTO2060
1900 PRINT@832,"                        ";
1910 PRINT@832,"(D)isk or (C)assette? ";:A$=INKEY$:IFA$=""THEN1910
1920 IFA$="d"ORA$="D"THENPRINT@832,"Prepare Disk, PRESS /";:GOSUB2160:GOTO1950
1930 IFA$="C"ORA$="c"THENPRINT@832,"Prepare Cassette, PRESS /";:GOSUB2160:GOTO20
10
1940 GOTO1910
1950 ONERRORGOTO2190:OPEN"O",1,"GAME/DAT"
1960 FORX=1TO3:FORY=1TO3
1970 PRINT#1,A(X,Y);B(X,Y);C(X,Y);D(X,Y);E(X,Y);F(X,Y);
1980 NEXT:NEXT                          ";:CLOSE
1990 PRINT@832,"                        ";
2000 GOTO590
2010 PRINT@832,"One moment, please      ";
2020 FORX=1TO3:FORY=1TO3
2030 PRINT#-1,A(X,Y),B(X,Y),C(X,Y),D(X,Y),E(X,Y),F(X,Y)
2040 NEXT:NEXT                          ";:GOTO590
2050 PRINT@832,"                        ";
2060 POKE236+Z,E(1,1):POKE242+Z,E(1,2):POKE248+Z,E(1,3)
2070 POKE358+Z,E(2,1):POKE364+Z,E(2,2):POKE370+Z,E(2,3)
2080 POKE480+Z,E(3,1):POKE486+Z,E(3,2):POKE492+Z,E(3,3)
2090 POKE605+Z,A(1,1):POKE611+Z,A(1,2):POKE617+Z,A(1,3)
2100 POKE733+Z,A(2,1):POKE739+Z,A(2,2):POKE745+Z,A(2,3)
2110 POKE861+Z,A(3,1):POKE867+Z,A(3,2):POKE873+Z,A(3,3)
2120 POKE559+Z,B(1,1):POKE437+Z,B(1,2):POKE315+Z,B(1,3)
2130 POKE687+Z,B(2,1):POKE565+Z,B(2,2):POKE443+Z,B(2,3)
2140 POKE815+Z,B(3,1):POKE693+Z,B(3,2):POKE571+Z,B(3,3)
2150 GOTO590
2160 A$=INKEY$:IFA$=""THEN2160                  ";:RETURN
2170 IFA$="/"THENPRINT@832,"                    "
2180 GOTO2160
2190 PRINT@832,"File not found   ";:GOTO590
2200 PRINT@457,Z@$;:PRINT@457+64,Y@$;:PRINT@0,"PRESS A NUMBER FROM 1-9 AND  ";
2210 PRINT@64,"THE SIDE NEXT TO OR BELOW IT ";
2220 FORT1=1TO2600:NEXT
2230 PRINT@0,"WILL MOVE TOWARD THAT NUMBER.";
2240 PRINT@64,"                             ";
2250 FORT1=1TO2000:NEXT
2260 PRINT@0,"THE COLORS ARE:                   ";
2270 FORX=1TO2000:NEXT:GOSUB310                 ";:PRINT@64,"R to
2280 FORTI=1TO1000:NEXT:PRINT@0,"A for auto scramble    ";:FORT1=1TO3000:NEXT:PRINT@0,AA$;:PRINT@64,BB$;
Reset cube
2290 RETURN
2300 PRINT@457,ZP$;:PRINT@457+64,YP$;
2310 RESTORE:GOTO530
2320 PRINT@L5,ZZ$;:PRINT@L5+64,YZ$;:RETURN
2330 PRINT@L5,ZY$;:PRINT@L5+64,YY$;:RETURN
2340 PRINT@L5,ZX$;:PRINT@L5+64,YX$;:RETURN
2350 PRINT@L5,ZW$;:PRINT@L5+64,YW$;:RETURN
2360 PRINT@L5,ZV$;:PRINT@L5+64,YV$;:RETURN
2370 PRINT@L5,ZU$;:PRINT@L5+64,YU$;:RETURN
2380 PRINT@L5,ZT$;:PRINT@L5+64,YT$;:RETURN
2390 PRINT@L5,ZS$;:PRINT@L5+64,YS$;:RETURN
2400 PRINT@L5,ZR$;:PRINT@L5+64,YR$;:RETURN
2410 CLS:FORX=0TO896STEP128
2420 PRINT@X,AA$;:PRINT@X+64,BB$;:
2430 NEXT
2440 FORX=1TO1000:NEXT
2450 PRINT@128+32,"DO YOU WANT INSTRUCTIONS ?";
2460 A$=INKEY$
2470 IFA$=""THEN2460
2480 IFA$="Y"ORA$="y"THEN2500
2490 GOTO240
2500 PRINT@170+64,"A cube will be drawn";
2510 PRINT@170+128,"on the screen .Then";
2520 PRINT@298+64,"mix it up using keys";
2530 PRINT@298+128,"1-9,Then try to get";
2540 PRINT@298+192,"the cube back to the";
2550 PRINT@298+256,"orginal pattern.";
2560 PRINT@448+288,"<PRESS ANY KEY TO START>";
2570 A$=INKEY$
2580 IFA$=""THEN2570ELSEGOTO240
2590 FORXXX=1TO20
2600 PRINT@L5,QQ$;:PRINT@L5+64,WW$;
2610 YYY=RND(9)
2620 ONYYYGOSUB730,840,920,1060,1190,1260,1370,1490,1560
2630 PRINT@1024-62,MM$;
2640 NEXT
2650 GOTO620
```







In order for us to consider your entry, we need the following items: a complete computer program, a brief game description, photographs or drawings of the graphics, a picture of you and a self-addressed, stamped envelope. Send it all to: First Screening, Electronic Fun, *350 East 81st St., New York, NY 10028. Include your phone number so we can reach you.*

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SCREENPLAYS

Continued from page 84

before it explodes. To do so, hit the grenade button.

As you travel northward, you'll come across a larger blue tank. Get in it. The large tank is your most powerful weapon. Its shells posess unlimited range. Each one travels to the borders of the playfield, as opposed to standard gunfire, which only reaches a distance of about one fourth the width of the screen before fizzling out. When behind the wheel of either type of tank, try to stick to the dirt roads. Armored vehicles travel slower through the grassy sections of the playfield.

As you approach the enemy fortress, you'll notice some brick walls. These afford safe cover for tanks and foot soldiers alike. If you seek shelter here, keep on your toes. Grenades lobbed from enemy foxholes may do you in if you stand flat-footed.

To capture the enemy fortress, you'll need to climb from your tank and score one direct hit with a grenade. This sequence is somewhat of an anti-climax compared to the treacherous route you took to get here. The fort is defended by a lone gun turret, which is easily outsmarted. If you're on target, a wounded enemy troop emerges from the dust with a raised white flag.□

LOOK-ALIKES

Continued from page 28

"RealSports", while Mattel's M Network version of its popular sports series is "Super Challenge".

Both series include baseball games tht are vastly superior to the now antique Atari *Homerun.*

The *RealSports* game adds one major dimension to the pitching: The computer randomly determines which of your pitches will be accurate for a given game. So while you may throw a great sinker during one game, it may be dreadful the next time you play. This added dimension makes the Atari game a bit more interesting than the M Network contest.

Both games allow you to control the direction in which the ball is hit and the movement of the base runners. In the Atari version you have additional control—instead of hitting only ground balls (as in the M Network game) you can also hit flies which may turn into home runs. Needless to say, this greatly increases the excitement.

Two Or Four Players

The M Network cartridge has only one two-player game. In contrast, RealSports has four games, including two which can be played against the computer. This is another strong advantage.

Still, there are a number of good features in the M Network game. For one thing, the designers have eliminated that distracting flickering. In the Atari game all of the moving players (runners, fielders with the ball, etc.) flicker. This problem never occurs in the Super Challenge game. It's also easy to judge whether a pitch is a ball or strike in the M Network contest. That is not the case in the Atari game, where all of the pitches look identical. And for younger players (or those of you who are lazy) the M Network game also includes a simplified version. When the difficulty switch is on "B", a hit results in all base runners advancing one base automatically.

So which game is for you? If you're after realism you should definitely consider the Atari game. But households with younger children might opt for the M Network game which is much easier.

Our choice—*RealSports Baseball* by Atari.

Both Atari and Mattel have tackled football, and both games are excellent. In both the Atari and Mattel games you can score safeties (two points for tackling your opponent in his own end zone while he has the ball). In the Atari game, however, you can also score field goals—a feature not in the Mattel game.

Both games are outstanding, but there are a number of differences between them. The single biggest drawback to Mattel's Super Challenge Football is that there is no kicking. This not only eliminates field goals, but also eliminates the chance to kick the ball away on a fourth down. But the designers of the Super Challenge game have more than made up for this by allowing you to program each player *individually.* In other words, instead of selecting one play and letting the computer set it up for you, you have the power to determine what *each* of your men will do. This feature *greatly* increases the strategy of the game.

There is also a trade-off between the graphics and sound effects of the two contests. The sound effects of the Atari game are vastly superior. The crowd frequently cheers you on and during plays you can hear your team running down the field. But, while the M Network game is quieter, the field is far more impressive. Every yard is marked off (instead of every ten yards as in the Atari contest), and the down markers are clearly displayed. Both games cleverly utilize a scrolling field; as you advance toward the end zone you are given a close-up view of the portion of the field that you are on. This is one of the best features of both games.

Our choice—Sorry folks. This one's a toss up! □

VIC PIX

Continued from page 83

Let's use this information or produce an effect you've seen in games hundreds of times. Your laser hits the enemy and the screen pulsates with color. Type this into your VIC.

```
10 REM FLASH
20 PRINT " ♥ "
30 POKE 36879,26
40 FOR T = 1 TO 300: NEXT T
50 POKE 36879, 30
60 FOR T = 1 TO 300: NEXT T
70 GOTO 30
```

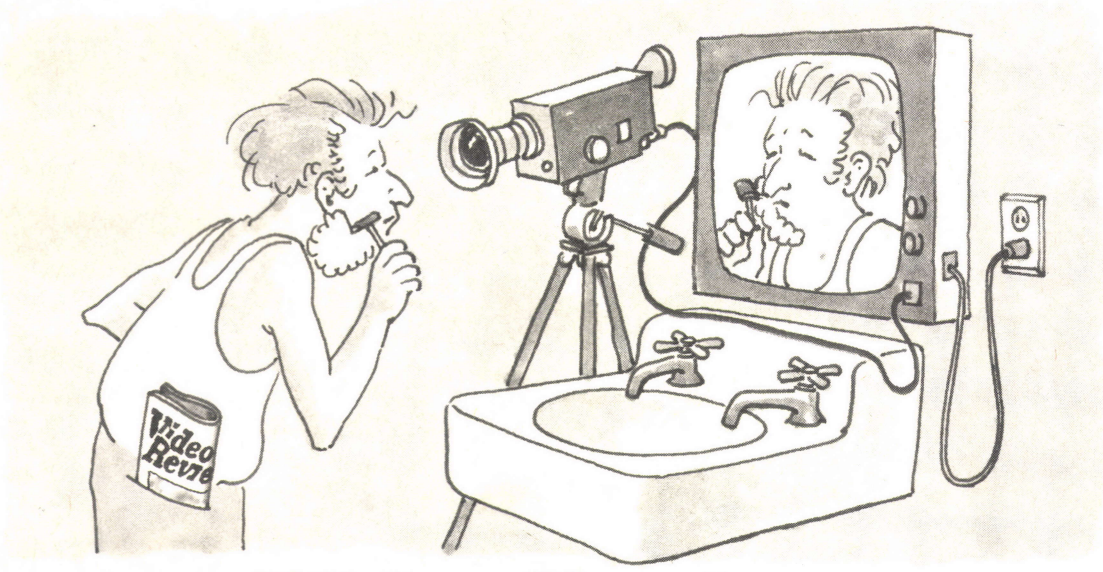
Lines 40 and 60 are time delay loops. You've already used them several times. To speed up the rate of flashing, make these changes.

```
40 FOR T = 1 TO 100: NEXT T
60 FOR T = 1 TO 100: NEXT T
```

Change the colors of the flash. For example,

```
30 POKE 36879,28
```

For people who take their video seriously:



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40 POKE 36879,29

This little flashing routine is very useful. You can insert it into other programs that you want to spice up with color. For example, go back to the HAPPY BIRTHDAY programs and improve them by adding the flashing routine.

The flashing routine is also quite nice in quizzes and guessing game programs. Let's say you write a program to drill addition and subtraction problems. A program like that gets very boring very quickly. Using what you have learned you can make the program more interesting and include a screen flash routine. Every time there's a wrong answer, the screen flashes and then says "TRY AGAIN."

Flashing Screen

The following program combines all the techniques we've learned about screen graphics. In line 20, remember that you get the inverse heart symbol by using the shift key and the CLR key. This symbol stands for "clear the screen." IN line 40, do not type out the names of the colors. Use the CONTROL key with the color keys. Get the graphic characters with the shift key. Leave four spaces.

The only complicated line in this program is line 70, which generates random numbers. These numbers are fed to line 80, which changes the combination of screen and border colors. Ready? RUN.

```
10 REM CARD SUITS WITH
FLASHING SCREEN
20 PRINT "     " [CLEAR: press-
ing shift and CLEAR
simultaneously causes the
screen to clear]
30 FOR C = 1 TO 100
40 PRINT
" ■ ◆ ♥ ♣ ■ ♠ ";
50 FOR T = 1 TO 50: NEXT T
60 NEXT C
70 X = INT (RND (1) *
8) + 8 + INT (RND (1) * 15) * 16
80 POKE 36879, X
90 GOTO 30
```

Here are some suggestions for tinkering with the program. To speed it up, change line 50 so it reads

50 FOR T = 1 TO 25: NEXT T

To make the colors change more frequently, change line 30 so it reads

30 FOR C

30 FOR C = 1 TO 60

And, for a very interesting effect, make the changes in line 30 and line 50 and then change line 90 as well so it reads

90 GOTO 20

What this last modification will do is to cause the screen to flash off once it fills with characters. All the programs above scroll. This one doesn't. Instead of scrolling, the screen fills up, flashes off, then starts the whole business all over again.□

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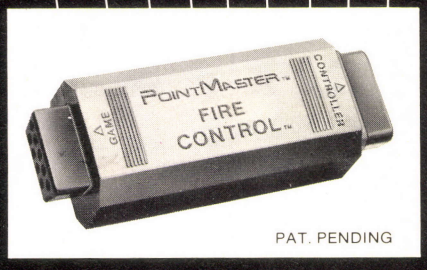

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TI 99/4A

Continued from page 78

RIGHT$ and ONERR, to name a few. Some of them, like SEG$ (which is really MID$) have been renamed for some unknown reason. So if you want to copy programs that have been published in computer magazines but designed for computers other than the TI 99/4A, you're going to have a tough time.

Space We Must

The lack of many of the standard BASIC commands is not the only problem with the 99/4A. TI BASIC is a very rigid language. Where most versions of BASIC will ignore the presence or absence of spaces, TI BASIC requires that all BASIC keywords be followed by a space and failure to do this will cause an error. It's true that some people prefer this rigid structure, but many programmers who have worked on other microcomputers do not. Another problem with the language is that it doesn't permit multiple statements per line, while almost every other microcomputer BASIC does. Finally, if your program requires the use of arrays, you are limited to only three dimensions. This can be a severe handicap. But many of the problems with TI BASIC have been eliminated with TI's Extended BASIC Command Module, which sells for about $100.

MAX And MIN

On the plus side, TI has added some really nice features. To begin with, they have added MAX and MIN functions which can be used to determine the largest and smallest numbers of a set. They've also added the constant "pi" to the language. More exciting than anything else, however, is the fact that they have borrowed an idea from FORTRAN and incorporated it into their Extended BASIC—the concept of subroutines that can be called with a list of parameters. This makes it very easy to develop libraries of subroutines that can be put together to form programs—an approach to programming that can reduce development time substantially.

Another excellent feature is that the user can redefine any of the 128 ASCII characters to produce any pattern desired. Each character consists of an 8-by-8 dot matrix whose elements can be selectively activated by the user. This helps make up for some of the shortcomings due to the lack of plotting commands, although not all of them.

There are plenty of peripherals available for the TI 99/4A. In fact, TI is currently offering 16 different add-ons for the machine. For storing your own programs written in BASIC you can use either a standard audio cassette recorder or you can purchase a disk system from TI. Up to three 5¼-inch drives can be connected, each with a storage capacity of 90K. Also available are an RS-232 interface, a modem, a memory expander, thermal and impact printers and a speech synthesizer module, to name just a few. TI has been one of the pioneers in the area of speech synthesis; their speech module is quite good and very easy to use.

Expandability

Expandability for the computer is not limited to hardware only; TI has also seen to it that a lot of software is available for the machine. In addition to the large number of game cartridges the company is producing—there are now some 280 to choose from—it has made available a lot of system software as well. For example, the TI machine was the first personal computer to offer the LOGO language for kids. In addition, PILOT and Pascal are also available.

All in all, TI has come a long way since the old 99/4. Last year alone, about 550,000 99/4A's were sold, and there doesn't seem to be any let-up. In fact, the biggest problem may be finding one in stock.

In the event that you do have trouble locating a store in your neighborhood that carries the TI, you can contact the company at PO Box 53, Lubbock, Texas 79408 or call (800) 741-2000.□

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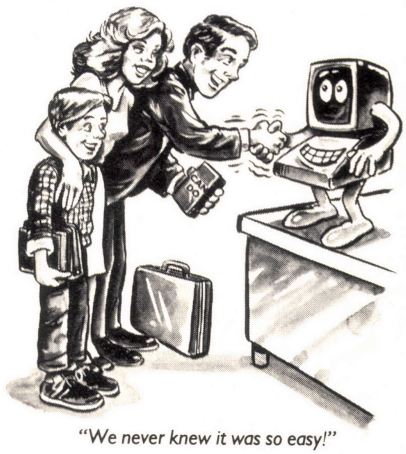

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BASIC

Continued from page 53

down the speed at which the computer prints the words.

This is not really a good example of the type of program you'd want to utilize GOSUB statements for. Something with graphics or sound or something incredibly complex would be more likely to need the GOSUB statement.

Let's say, for example, you want to do something with graphics and between each line drawn, you want to insert the same time-delay loop. You don't want to have to type it in every single time so you put it into a subroutine. Try this program even though we haven't covered many of the terms in it. Remember, this is in Atari BASIC.

```
10 GR. 3
20 COLOR 2
30 PLOT 15, 5
40 DRAWTO 10,5
50 GOSUB 1000
60 DRAWTO 10,15
70 GOSUB 1000
80 DRAWTO 15,5
90 GOSUB 1000
100 PLOT 10,10
110 DRAWTO 15,10
120 GOSUB 1000
130 PLOT 25,5
140 DRAWTO 20,5
150 GOSUB 1000
160 DRAWTO 20,15
170 GOSUB 1000
180 PLOT 20,10
190 DRAWTO 25,10
200 END
1000 FOR T=1 TO 500:
NEXT T
1020 RETURN
```

And that's all folks, for GOSUB.□

INTELLIVISION

Continued from page 33

version of one of Mattel's most popular games, Astrosmash. As musical notes fall from the top of the screen in the pattern of apopular song, the player must counterattack by striking the proper keys. Shoot the notes down in the right sequence, and you are, in effect, playing the song.

All the flash, fluff, and gadgetry

aside, Intellivision II is still a video game system, and the most important question to be answered is, "Are the games any good?" In my opinion they are getting better.

A latecomer to the licensing scene, Mattel now offers some home adaptations of arcade games. I would have thought that Mattel would move on a hot arcade game license sooner, since their system (aside from ColecoVision) is one of the few powerful enough to do an arcade game justice on a home screen.

Intellivision's rendition of Data East's *Lock 'n Chase*, though a poor man's *Pac-Man*, stands as one of the best arcade-to-home adaptations ever offered for use on any system.

Another Data East creation, *Burger Time*, will also surface as an Intellivision cartridge later this year. For those of you unfamiliar with this game, the action unfolds something like this: The player, as Peter Pepper, must assemble a bunch of hamburgers by knocking all the necessary ingredients onto a row of plates running along the bottom of the screen.

Mattel will be releasing 12 new games for the Intellivision II in 1983. At this time we have only seen *BurgerTime*, but here is a sneak peek at some others . . .

Buzz Bombers—When you hit the honey bees, they become pieces of honeycomb.

Mission X—Fly bombers both night and day on a rolling screen.

Loco-Motion—A train game. You must avoid collisions, pick up passengers and stay on schedule.

XIV Winter Olympics—Ski jumping and bobsledding. Play against another player or the computer.

Sharp Shot—A moving target game. You have the choice of four targets—a pass receiver, a spinning spacecraft, navy ships or monsters.

Shark! Shark!—Control a small fish and attempt to eat smaller fish while avoiding sharks.

Mystic Castle—A medieval fantasy in which you must patrol the forests and slay dragons.

Arctic Squares—You're a penguin trying to escape from rival penguins, a seal and a polar bear.

Another development of interest to the potential purchaser is the growing support of Intellivision by independent software specialists. Imagic, Activision and Coleco all offer Intellivision-compatible games.

If you are considering buying Intellivision, now is the time. The software selection has fleshed out, both in quantity and quality. The cost has never been lower and it is now competitive with the asking price of comparable systems. Above all it is an expandable system, with add-ons and peripherals to suit your future needs. In the "here today, gone tomorrow" world of video games, this is important. □

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KITCHENS

Continued on page 43

knowing how the computer works. If you can design a computer from the ground up it will help you learn how to program. People are doing that all the time now. The first thing somebody wants to do when they buy a computer is learn how to program it. I learned when I was going to night school.

EF: Where did you go to school?

GK: Fairleigh Dickinson University in New Jersey. The engineering department was very good, although when I was there they had very archaic equipment—1940 oscilloscopes and things like that.

EF: Everybody assumes that the big schools for engineering are MIT and Stanford . . .

GK: Actually, four out of the five designers at the Activision Eastern Design Center are Fairleigh Dickinson people. I don't even think they know it.

EF: They do now. One last question, Gary—what's your next game?

GK: Well, of course I can't tell you any details, but I'll tell you this—I definitely don't want to do a real serious shoot-'em-up. I've been watching people's reactions to *Keystone Kapers*, and the thing that they seem to like the most is that it's funny. So you can bet my next game will be a funny one.□

ROBOTS

Continued from page 74

The image of the robot in science fiction has not always been benign. The first robots, in fact, are the favorites of crossword puzzle fans everywhere—Rossum's Universal Robots from the play *R.U.R.* by the Czech writer Karel Capek. In this bitter satire on socialism, the inventor of the robots (which comes from the Czech word *robota*, or "worker") sees his creations go berserk and rise up against him. Rossum's robots are strictly of the industrial variety, you see, but like BOB they have intelligence and resent being mere drones.

Bushnell is too much of a philosopher to ignore what he calls the "down side" of the robotics age.

He is convinced, for example, that "robots' lib" groups will sprout up, although they'll be led by humans, not robots. He also wonders what would happen if a deranged computer freak programmed a robot to shoot someone. "Who do you bring to trial?" he asks. "The man who made the arm assembly? The guy who did the seek and identify algorithm? All I know is, if I were Melvin Belli I'd sue everybody. There will be the potential for robotic mayhem. The artificial intelligence in a robot is absolutely suited for certain law and order functions—it would make the world's greatest stool pigeon. It's a question of power—any time there's power it will be used for good, and it will be used for evil. But on the whole, I think they're going to be very docile, subservient guys."

With his own robots, Bushnell has built in a lot of safety checks. "If there's too much stress on the motors—if it's pushing against something heavy—the whole thing shuts down. There's also an overall executive that's watching all the systems, and it shuts him down if it detects program errors. Otherwise he'd go berserk." At one point the Androbot scientists programmed BOB to say a short two-word phrase before he shut down due to program error—the same expletive deleted you might shout in an arcade when you get eaten.

Ultimately, what the androbots will do, says Bushnell, is make a lot of people rich—all of us. Thanks to Atari and his other business ventures, Bushnell is already rich, but as he says, "It's lonely at the top. You've got to have more guys that can play with the same toys you do. Did you ever stop to think of the difference between my lifestyle today and the way most people live? It has nothing to do with dollars. I have my beers brought to me. Now, with robots, somebody who's not rich can have his beers brought to him. Therefore he is, in fact, rich."

It's no use trying to pin Bushnell down on specifics for the future as he sees it. "I have too big a problem right now with being viewed as a marginal crazy," he says. "It's very easy for people to equate thinking about the future with flakiness. You know, there are an awful lot of people who are so afraid of the future that they will do anything to convince themselves that, in fact, the future is not going to happen—that everything is going to be the same. The age of Babbitt is still with us—'If we could just go back to small town America, where you walk down the street to the courthouse, say hello to the mayor, and then go down to Mr. Jones' grocery store.' People have a real hard time, though, thinking in terms of the children who died because penicillin hadn't been invented. It's very easy to have selective Utopias in either direction—past or future.

"My flaky image really started when I said back in 1974 that the video game business would be a multi-billion dollar industry by 1981 or 1982. People said, 'Bushnell's really been smoking something,' and that's the part that sticks in their minds—they forget the predictions came true. So I worry a little about saying that the robot will be more important than the automobile, but I'd be willing to bet my life on it." □

ANDROBOTS IN BRIEF

BOB: What makes him tick

Contained in BOB's three-foot high frame are three 16-bit Intel 8088 microprocessors, giving him a memory of more than three megabytes (three million bytes). His memory is expandable. Function lights indicate that his ultrasonic sensors and infra-red sensors are active and that a human companion has been targeted. He is also equipped with direction lights. The infra-red sensors are attuned to the frequency of human body heat and the ultrasonic sensors measure distance within one-tenth of a foot accuracy. Moving speed is two feet per second, although this may vary with surface conditions. He has two high-torque motors (one for each wheel) and three gel electrolyte rechargeable batteries. LED indicators warn when a recharge is needed.

As BOB moves about the room his head scans from side to side, collecting data. He's designed to distinguish humans from other heat sources and seek them out. When he meets a person, he'll stop and go into his routine—tell jokes, sing a song, whatever he feels like doing. When he decides the person—or he himself—has had enough, he'll move on to someone else. When he is running low on energy, he'll return to his recharger for a health-giving nap. His sensors are triangulated down, so he won't inadvertently fall down the stairs. BOB requires no knowledge of computers or programming on the part of the owner. His price: $2,495.

TOPO: A new kind of peripheral

TOPO's intelligence is provided by an external computer—right now an Apple II, but soon he'll work with Atari, Commodore, Radio Shack and other models. He's the same size as BOB, only lighter, and is equipped with an internal radio-frequency receptor to receive signals from either a joystick-controlled direction signal, or direct from the computer, at distances up to 100 feet away. He's got two high-torque motors and direction signals. Like BOB, he moves two feet per second, but operates on only one gel electrolyte sealed rechargeable battery. LED indicators warn of low power. An optional voice module is available, as is an optional Androwagon, useful for hauling laundry, canapes or cordless telephones.

Two software packages are available—Topologo and Topoforth. These will make it easier for the owner to program complex maneuvers into TOPO so he can automatically roam throughout your house (although neither Androbot can climb stairs). With the software, TOPO can respond instantly to such commands as "Go to front door" or "Go to kitchen." TOPO's price: $995. The optional voice: $200. Topologo and Topoforth: $125 each.

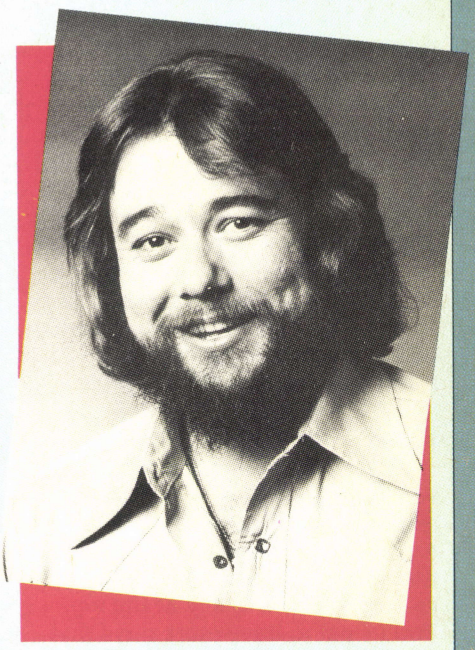
Both robots are constructed of lightweight vacu-formed plastic. The wheel assembly is said to make the androbot the world's first inherently stable two-wheeled "vehicle".

Androbot, Inc. is located at 1287 Lawrence Station Rd., Sunnyvale, CA 94086.

top secret

Sex or the single robot

Howdy, gamers! Did you know that if you press a certain sequence of keys on the Atari 400/800 version of **Super Breakout** game, the words "I love Suzie and Benji too" appear on the screen? Can somebody tell me the sequence of keys? . . . They tell me that **Cynex**, the company that made those wireless joysticks, has been swallowed up by Atari, who will now manufacture the product . . . What's an **Actimite**? An Actimite is anyone who loves Activision games. If you ask me, it sounds like a tiny insect- . . . **Universal Pictures** is rumored to be coming out with six **Atari** compatible carts soon, including **Jaws** . . . **Ed Salvo**, the guy who became Apollo's head designer by answering an ad in the paper, quit the company two weeks before they filed for bankruptcy. He's started his own company, **Video Software Specialists** . . . What do the **Phillippines, Indonesia, Singapore** and **Malaysia** have in common? They've all banned video games entirely . . . Will somebody please tell me if **Astrocade** is in business or out of business? We never see any new games, but the system was advertised in the New York Post for **$99**. Oddly, **Consumer Reports Magazine** named theirs the best video game system going . . . Last Christmas, New York was flooded with **chocolate Pac-Men** that contained a product called chocolate-coating, but no chocolate. Consumer advocate **Richard Kessel** said, "It looks like chocolate and it tastes like chocolate but it isn't chocolate." . . . Silly rumor of the month—somebody (**Zimag**?) is coming out with a line of video games for senior citizens. Give me a break. What do you have to do, guess which glass your false teeth are in? . . . When you turn on a **Q*Bert** arcade game in the morning, it says, "**I'm Q*Bert! I'm turned on!**" I don't make the news folks, I just report it . . . **Free the Atari 600!** Whatever happened to that computer anyway? . . . **Burning question**—what is the best method for a video game company to promote its products; with robots or girls with slinky dresses? . . . **Hawaii** has the **first** regular video game radio show, starring a guy named **Buck Buchanan** . . . **Coke** machines are now being outfitted with **video games.** After you buy your drink, a monkey throws cans of Coke at you from a tree . . . **Tron the Game** made more money than **Tron the Film!** The confusing **$21 million** movie died at the box office, but the arcade game has taken in **$60 million** all by itself . . . Do you know the **official Atari handshake**? According to their newsletter, you "rotate the thumb you're holding, making believe it's a joystick." Can I barf now? . . . Want a used **Asteroids** game for **$595**? Contact **Computer Earning Games,** 51 Monroe St., 18th floor, P.O. Box 1687, Rockville, MD 20850 . . . A company called **Cosmi** plans to release "tri-compatible games"—games that will play on the **Atari 400/800, Commodore VIC-20** and **TI 99/4A** . . . Okay, Okay. I was wrong! The Atari driving controls are **not** just single paddles. So sue me . . . According to the **New York Times, Coleco** was one of the ten **Super Stocks of 1982.** The company grew **318%** over the year . . . **U.S. Games** is coming out with an incredible new joystick . . . At the **Golden Dome** arcade in **State College, PA,** if you beat the high score on a game, you get to keep the machine! . . . **Atari** is suing **Imagic,** claiming that the **Intellivision** version of **Demon Attack** is a ripoff of **Phoenix,** which Atari has licensed . . . The **National Coalition on Television Violence** has taken a stand against video games, claiming that violence dominates **89%** of all arcade games and **65%** of all home games. Ho-hum . . . Future plans—**Atari** arcades. Only Atari coin-op games.



Game show host Buchanan

Look out for 'em. Is there a **Demon Fortress** in the VCS **Demon Attack**? We hear it's only on **Intellivision** . . . Nice chatting with ya . . .

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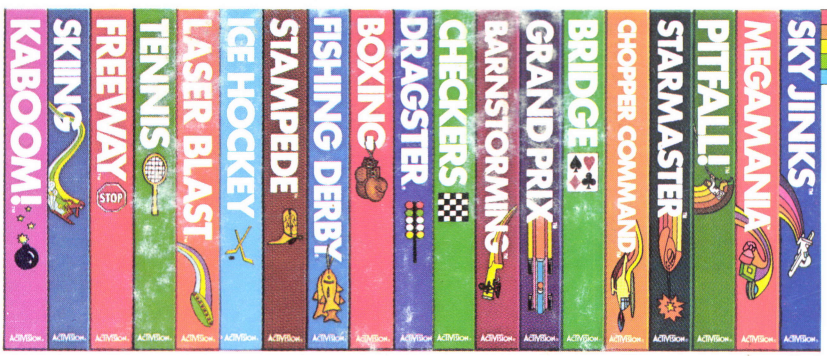

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